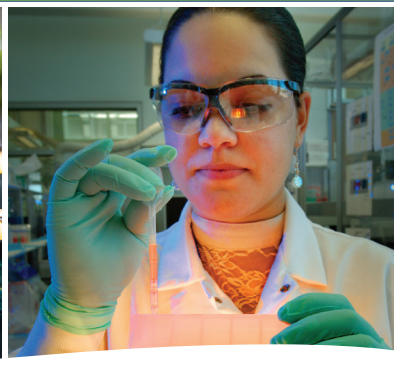




2019

Fourth National Report on Human Exposure to Environmental Chemicals *Updated Tables, January 2019, Volume One*



**U.S. Department of
Health and Human Services**
Centers for Disease
Control and Prevention

Fourth National Report on Human Exposure to Environmental Chemicals, Updated Tables, January 2019

The *Fourth Report on Human Exposure to Environmental Chemicals, Updated Tables, January 2019* (the *Updated Tables, January 2019*) presents nationally representative, cumulative biomonitoring data gathered from 1999–2000 through 2015–2016. It includes all the data from each of the previous *National Reports on Human Exposure to Environmental Chemicals* and each of the previous *Updated Tables* (collectively, the *Report and Updated Tables*).

In each survey period, the reported chemicals or their metabolites were measured in blood, serum, and urine samples from random subsamples of the National Health and Nutrition Examination Survey (NHANES). These subsamples typically consisted of about 2,500 participants – exact numbers are included in the tables. Survey data and samples are collected by the Centers for Disease Control and Prevention (CDC's) National Center for Health Statistics. CDC's Environmental Health Laboratory (Division of Laboratory Sciences (DLS), National Center for Environmental Health) used mass spectrometry methods to obtain the blood, serum, and urine exposure measurements presented in the *Report and Updated Tables*.

The data for chemicals with results from the 1999–2000 to 2009–2010 survey periods are located in one table. A second table begins with data from the 2011–2012 survey period. For example, blood lead data for 1999–2010 are shown in one table, followed by a second table showing blood lead data for 2011–2014. Of note, not all chemicals have data for all survey cycles. Most of the table titles include the survey periods for which data are displayed in that table. For chemicals measured in pooled samples starting in 2005–2006, the first table for a chemical presents results measured prior to 2005 in individual samples. The second table gives results for the pooled measurements.

The term *environmental chemical* refers to a chemical compound or chemical element present in air, water, food, soil, dust, or other environmental media (e.g., consumer products). Biomonitoring is the assessment of human exposure to chemicals by measuring the chemicals or their metabolites in human specimens such as blood or urine. A metabolite is a chemical alteration of the original compound produced by body tissues. Blood, serum, and urine levels reflect the amount of the chemical that actually gets into the body by all routes of exposure, including ingestion, inhalation, and dermal absorption. The measurement of an environmental chemical in a person's blood or urine is a measure of exposure; it does not by itself mean that the chemical causes disease or an adverse effect. Research studies, separate from these data, are required to determine which blood or urine levels are safe and which are associated with disease or an adverse effect.

The *Report and Updated Tables* provide geometric means and percentiles of environmental chemicals by age group, gender and race/ethnicity for blood, serum, and urine levels measured in individual samples. Arithmetic means and unadjusted standard errors are provided by race/ethnicity, gender, age-defined categories for serum levels measured in pooled samples. More in-depth statistical analysis, including multivariate analysis incorporating health endpoints and other predictive variables, is beyond the scope of this document. We encourage scientists to examine the data further through analysis of the raw data available at <https://www.cdc.gov/nchs/nhanes/>.

The *Updated Tables* has been expanded into two volumes:

- **Volume One** provides data on the general U.S. population. It includes recently released data from NHANES 2005–2006, 2007–2008, 2009–2010, 2011–2012, 2013–2014, and 2015–2016. Volume One also includes updated introductory sections from the *Fourth Report on Human Exposure to Environmental Chemicals, 2009*. These sections are the Data Sources and Data

Analysis, Interpretation of *Report* and *Updated Tables* Data, and Chemical and Toxicological Information.

- **Volume Two** provides data for chemicals measured in pooled samples. Some of these chemicals were previously measured in individual samples. This volume includes recently released data from NHANES 2011–2012 and 2013–2014. Volume Two also provides data for the special sample of adult cigarette smokers and nonsmokers, including recently released data from NHANES 2015–2016. Of note, the age for eligibility in the special sample decreased from 20 years and older in NHANES 2011–2012 to 18 years and older in NHANES 2013–2014 and 2015–2016 (NHANES lowered the age for asking the smoking questions in 2013).

The *Updated Tables, January 2019* provides data for 352 chemicals, of which 6 are new and 162 have been updated since the *Updated Tables, March 2018*. Many of the data tables include a link at the bottom to a biomonitoring summary that has information about a specific chemical or chemical group. Several listings also have a link to a factsheet about the chemical or chemical group. Two appendices are updated to include information pertinent to these chemicals and the other chemicals included in the *Updated Tables* ([Appendix C. Limit of Detection Table](#); [Appendix D. References for Biomonitoring Methods](#)).

On the *Report* website, “Chemicals in the Fourth Report and Updated Tables” is a complete list of the chemicals in *Updated Tables January 2019*. The *Updated Tables, January 2019* provides updates for 205 chemicals and 138 new chemicals added since the publication of the *Fourth Report*.

The [National Report on Human Exposure to Environmental Chemicals](#) website is the best resource for updates of available data. The *Fourth National Report on Human Exposure to Environmental Chemicals, 2009*, can also be downloaded from this website.

Public Health Uses of the *Report* and *Updated Tables*

The overall purpose of the *Report* and *Updated Tables* is to provide specific information to scientists, physicians, and health officials to help prevent exposure to environmental chemicals. Some public health uses of the exposure information in the *Report* and *Updated Tables* include the following:

- To determine which chemicals are getting into U.S. residents and at what concentrations.
- To determine the prevalence of people with levels of chemicals above known toxicity levels (e.g., blood lead level greater than or equal to a specific concentration).
- To determine the prevalence of people with levels of chemicals that put them at increased risk for toxicity.
- To establish reference ranges that physicians and scientists can use to determine whether a person or group has an unusually high exposure. (This information is especially helpful to identify population groups that merit further assessment of exposure sources or health effects.)
- To assess the effectiveness of public health efforts to reduce exposure of U.S. residents to specific chemicals.
- To determine whether exposure levels are higher among potentially vulnerable groups, such as minorities and children.
- To track trends in levels of exposure of the population.
- To set priorities for research on human health effects.

What's New and Different?

The *Updated Tables, January 2019*, include chemicals that have results available from the NHANES survey periods 1999-2000 through 2015-2016. New chemicals measured for the first time include mono-oxoisobutyl phthalate (MONP), a metabolite of di-isobutyl phthalate (DiNP); mono-2-ethyl-5-carboxypentyl terephthalate and mono-2-ethyl-5-hydroxyhexyl terephthalate which are metabolites of di-2-ethylhexyl terephthalate (DEHTP); cyclohexane-1,2-dicarboxylic acid mono carboxyisooctyl ester (MCOCH), a metabolite of DINCH; and two blood volatile organic compounds: benzonitrile and isobutyronitrile.

Chemicals with updated data in this release are

- blood disinfection by-products;
- blood mercury species (inorganic, ethyl, and methyl mercury);
- urinary metals in the general population and in a special sample of adult smokers and nonsmokers;
- urinary arsenic and arsenic species in the general population and in a special sample of adult smokers and nonsmokers;
- serum per- and polyfluoroalkyl substances (PFAS);
- urinary phthalate and phthalate alternative metabolites;
- blood VOCs in the general population and in a special sample of adult smokers and nonsmokers;
- urinary VOC metabolites in the general population and in a special sample of adult smokers and nonsmokers;
- serum PBDEs and PBB 153 (pooled);
- serum organochlorine pesticides and metabolites (pooled);
- serum PCBs and mono-ortho-substituted PCBs (pooled).

Change in the Population Sampled for Urinary Chemicals: NHANES 2015-2016

Beginning with the NHANES 2015-2016 survey period, the age for urine collection was lowered from age 6 to age 3 years. This change was made to obtain data for younger children, a vulnerable population with limited urinary data. The urinary environmental chemicals are measured in a full sample (i.e., all children able to provide a urine specimen) of children 3 to 5 years old. For ages 6 years and older, the urinary environmental chemicals continue to be measured in a representative one-third sample of participants.

The addition of ages 3 to 5 years to the survey population will mean that descriptive statistics (geometric mean, selected percentiles) for the total population and non-age related demographic groups in NHANES 2015-2016 will not be directly comparable to descriptive statistics in earlier NHANES survey periods. This is because the populations sampled are not the same.

Updated Tables in Two Volumes

Continuing with this release, the *Updated Tables* are presented in **two volumes**, each a separate PDF. This change was made because the file size of the single PDF had become so large that it could not easily be shared or sent as an attachment. The format of each PDF has been modified to comply with 508 requirements, making them accessible to visually-impaired users. **Volume One** contains data tables for most of the chemicals measured in the U.S. general population. **Volume Two** contains data tables for the persistent organic pollutants and pesticides previously measured in individual samples and are currently measured in pooled samples. **Volume Two** also contains data tables for the special sample of

adult cigarette smokers and nonsmokers, including recently released data from NHANES 2015-2016. We anticipate that future *Updated Tables* will continue to be presented in two volumes.

PFOS and PFOA Results for NHANES 2013-2014 and 2015-2016

Starting in 2013, we began measuring linear and branched isomers of both PFOS and PFOA and no longer measuring total PFOS or PFOA. The isomers of each chemical represent more than 95% of what was previously reported as PFOS and PFOA. PFOS and PFOA were calculated by summing the linear and branched isomers for each participant before applying the appropriate sample weight. Because the 2013-2014 and 2015-2016 values are a calculated sum, there is no limit of detection (LOD) for PFOS and PFOA. Data tables for each of the four isomers also are presented. See [Calculation of PFOS and PFOA as the Sum of Isomers](#) for more details. The calculated PFOS and PFOA results can be used to compare with previous measurements and to examine trends in the general U.S. population.

The “What’s New and Different” sections in previous releases of *Updated Tables* is available in the Archives from *Updated Tables* at: <https://www.cdc.gov/exposurereport/>.

Data Sources and Data Analysis

Blood, serum, and urine samples from NHANES

Biomonitoring measurements for CDC's *National Report on Human Exposure to Environmental Chemicals* and *Updated Tables* (referred to as the *Report* and *Updated Tables*, respectively) are made using samples from participants in the National Health and Nutrition Examination Survey (NHANES), conducted by CDC's National Center for Health Statistics (NCHS). NHANES is designed to collect data on the health and nutritional status of the U.S. population. NHANES collects information about a wide range of health-related behaviors, performs physical examinations, and collects clinical samples for laboratory tests. Beginning in 1999, NHANES became a continuous survey, sampling the U.S. population annually and releasing the data in 2-year cycles. The sampling plan follows a complex, stratified, multistage, probability-cluster design to select a representative sample of the civilian, noninstitutionalized population in the United States based on age, gender, and race/ethnicity.

The NHANES protocol includes a home interview, followed by a standardized physical examination in a mobile examination center. As part of the examination, blood is obtained by venipuncture from participants aged 1 year and older, and urine specimens are collected from participants aged 6 years and older. Starting with the 2015–2016 survey, urine specimens were collected from children ages 3–5 years. Additional detailed information on the design and conduct of the NHANES survey is available at <https://www.cdc.gov/nchs/nhanes/>.

NHANES measures environmental chemicals in blood, serum, or urine specimens. Most of the environmental chemicals are measured in randomly selected subsamples within specific age groups. Randomization of subsample selection is built into the NHANES design before sample collection begins. Different random subsamples include different participants. Subsampling is needed to ensure an adequate quantity of sample for analysis and the mass spectrometry analytical methods.

- Data tables in the *Report* and *Updated Tables* specify age groups and sample sizes for each exposure measurement.
- Blood measurements in children younger than 12 years are limited by the amount of blood that can be collected.
- Blood metals are measured in participants aged 1 year and older.
- Beginning in 2011, the blood mercury species methyl mercury and ethyl mercury were added.
- Serum cotinine and hemoglobin adducts of acrylamide and glycidamide are measured in the entire NHANES sample for participants ages 3 years and older.
- Cotinine data are shown only in nonsmokers in the *Report* and *Updated Tables*.
- Most measurements of chemicals in serum are made in samples from participant ages 12 years and older.
- Urine was collected from participants ages 6 years and older until 2015, when it became possible to collect urine from children as young as 3 years.
- Most urine chemicals are measured in a representative one-third subsample, but a full sample is used for participants ages 3–5 years.

If a particular chemical or an entire chemical group has no detectable results for three survey periods, it is usually not measured in subsequent survey periods.

- The sulfonyl urea herbicide group was measured in NHANES 2003–2004, 2005–2006, and 2007–2008 with no detections, even at the 95th percentile, so this group is no longer measured in the ongoing survey.

- Mono-*n*-octyl phthalate (MOP), a phthalate urinary metabolite, was not detected above the 95th percentile for more than three survey cycles, so it was no longer reported after 2010.
- Several banned organophosphate and organochlorine pesticides have become largely undetectable and are no longer measured.
- Some chemicals are widely detected but have had unchanging levels in the population (e.g., phytoestrogens) and are no longer measured.

By discontinuing measurements of chemicals that are rarely or not detectable, or well-characterized chemicals for which the source of exposure is consistent, CDC's Environmental Health Laboratory can better allocate and optimize its limited resources. It can use those resources to develop methods to measure new chemicals of concern and continue to measure population exposure to chemicals of concern.

Beginning with NHANES 2005–2006, CDC used a weighted pooled-sample design to measure serum concentrations of dioxins, furans, polychlorinated biphenyls (PCBs), organochlorine pesticides and metabolites, and brominated flame retardants (polybrominated diphenyl ethers and polybrominated biphenyl [PBB] 153). Pooled samples are used when larger sample volumes are needed to improve the sensitivity of the measurements and to reduce the number of samples being analyzed, balancing the cost of the analysis against a low frequency of detectable results.

The following considerations guided the selection of chemicals in the *Report* and *Updated Tables*:

- Scientific data suggested exposure in the U.S. population.
- Health effects known or suspected to result from some levels of exposure were serious enough to cause concern.
- Data were needed to assess the effectiveness of public health actions to reduce exposure to a chemical.
- Biomonitoring analytical methods could provide results with adequate accuracy, precision, sensitivity, specificity, and throughput.
- Adequate blood or urine samples were available.
- Incremental analytical costs to perform the biomonitoring analysis for the chemical were reasonable.

The availability of biomonitoring methods with adequate performance and acceptable cost was a major consideration. Details on the prioritization process for scoring nominated chemicals and the resulting scores are available at: https://www.cdc.gov/exposurereport/chemical_selection.html.

Laboratory Analysis

CDC's Environmental Health Laboratory (Division of Laboratory Sciences, National Center for Environmental Health) made the blood, serum, and urine exposure measurements in the *Report* and *Updated Tables*. The following analytical techniques were used for measuring the environmental chemicals or their metabolites in blood, serum, and urine:

- Isotope dilution mass spectrometry
- Inductively coupled plasma mass spectrometry
- Graphite furnace atomic absorption spectrometry

Laboratory measurements underwent extensive quality control and quality assurance review:

- Tolerance limits for operational parameters were maintained.
- Quality control samples were measured in each analytical run to detect unacceptable performance in accuracy or precision.

- Traceable calibration materials were verified.

Appendix D lists references for the analytical methods used to measure the different chemicals.

Data Analysis

NHANES is a complex, stratified, multistage, probability-cluster design survey. Because of that, sample weights must be used to adjust for the unequal probability of selection into the survey. Sample weights also are used to adjust for possible bias resulting from nonresponse and are post-stratified to U.S. Census Bureau estimates of the U.S. population. Data were analyzed using Statistical Analysis System (SAS) (SAS Institute Inc., 2002) and the SUDAAN (RTI International, NC) statistical software packages. SUDAAN uses sample weights and calculates variance estimates that account for the complex survey design. The design does not permit straightforward analysis of exposure levels by non-targeted strata such as locality, state, or region; seasons of the year; proximity to sources of exposure; or by use of particular products. NCHS guidelines for analysis of NHANES data are available at <https://wwwn.cdc.gov/nchs/nhanes/analyticguidelines.aspx>.

The *Report* and *Updated Tables* present descriptive statistics on the blood, serum, or urine levels for each environmental chemical reported. Statistics include unadjusted geometric means and percentiles with confidence intervals. In each table, results are given for the total population and by age group, gender, and race/ethnicity, as defined in NHANES. For these analyses, based on the sample design, race/ethnicity is categorized as Mexican American, non-Hispanic black, and non-Hispanic white. Beginning in 2011–2012, two additional categories were added: all Hispanic and non-Hispanic Asian (referred to as Asian in the tables). Other racial/ethnic groups are sampled, but the proportion of the total U.S. population represented by other racial/ethnic groups is not large enough to produce valid estimates. Other racial/ethnic groups are included in estimates that are based on the entire population sample. Age groups are as described for each chemical in each data table. Gender is coded as male or female.

Units

For chemicals measured in urine, levels are presented per volume of urine and per gram of creatinine. Urinary levels are expressed both ways in the literature and used for different purposes. Levels per gram of creatinine (i.e., creatinine corrected) adjust for urine dilution. For example, a person who drinks more fluids than another person will likely have a higher, but more dilute, urine output. Interpretation of creatinine-corrected results should also recognize that creatinine correction can partially adjust for differences in lean body mass or renal function among persons. Children and young adolescents typically have less muscle mass than adults. Because muscle is an important source of creatinine in urine, children have lower urinary creatinine concentrations than do adults. The lower urine creatinine concentration can result in higher creatinine-corrected results in children in comparison with adults.

For dioxins, furans, PCBs, and organochlorine pesticides, serum levels are presented per gram of total lipid and per whole weight of serum. These compounds are lipophilic and concentrate in the body's lipid stores, including the lipid in serum. Serum levels reported per gram of total lipid reflect the amount of these compounds stored in body fat. Serum levels per whole weight of serum are also included for easier comparison with studies investigating exposure to these chemicals and reported levels in these units. Other mostly non-lipophilic chemicals measured in serum are expressed per liter of serum (e.g., micrograms per liter). Acrylamide and glycidamide adducts are expressed in picomoles per gram of blood hemoglobin.

Results are reported in standard units, generally conforming to those most commonly used in biomonitoring measurements. Table 2 shows some useful unit conversions.

Table 2. Units of measurements and abbreviations

Unit	Abbreviation	Value
liter	L	--
deciliter	dL	10 ⁻¹ liters
milliliter	mL	10 ⁻³ liters
gram	g	--
milligram	mg	10 ⁻³ grams
microgram	µg	10 ⁻⁶ grams
nanogram	ng	10 ⁻⁹ grams
picogram	pg	10 ⁻¹² grams
femtogram	fg	10 ⁻¹⁵ grams

Geometric means

A geometric mean gives a better estimate of central tendency for data that are distributed with a long tail at the upper end of the distribution. This type of distribution is common when measuring environmental chemicals in blood or urine. The geometric mean is influenced less by high values than is the arithmetic mean. In the *Report* and *Updated Tables*, geometric means are calculated by taking the log of each concentration and then using SUDAAN software to compute the weighted mean of those log-transformed values. Ninety-five percent confidence intervals around the weighted mean are calculated by adding and subtracting an amount equal to the product of a Student's *t*-statistic and the standard error of the weighted mean estimate. The degrees of freedom of the *t*-statistic was determined by subtracting the number of strata from the number of primary sampling units, according to the data available from the complex survey design. The standard error was computed with SUDAAN's PROC DESCRIPT procedure and "with replacement" design option (design = WR), with Taylor series linearization used for variance estimation. The weighted geometric mean and its confidence limits were obtained by taking the antilog of this weighted mean and its upper and lower confidence limits.

The measured value for a pooled sample is comparable to an arithmetic average of measurements in individuals. Consequently, the pooled sample result is expected to be higher than the geometric mean of multiple individual results. In addition, direct calculation of the design effects required for accurate standard error and confidence interval estimation is not possible because samples are pooled across the design cells of the original survey. For these reasons, data tables showing the pooled sample results present only weighted arithmetic means and unadjusted standard errors for each category. The standard errors are unadjusted and therefore, do not reflect the design effects of the survey. In many cases, the standard errors are based on very few pooled sample measurements and cannot be expected to accurately reflect the true imprecision of the weighted arithmetic mean estimates. Therefore, when the unadjusted standard error was more than 30% of the weighted arithmetic mean, this is noted with a double asterisk (**) and footnoted.

Limit of detection

The limit of detection (LOD) is the level at which the measurement has a 95% probability of being greater than zero (Taylor 1987). In the *Updated Tables*, the LODs for each chemical and survey period are provided in a footnote to each data table and collectively in Appendix C. Concentrations less than the LOD are assigned a value equal to the LOD divided by the square root of two for calculation of geometric means. Assigning a value of the LOD divided by two made little difference in geometric mean estimates. If the proportion of results below the LOD was greater than 40%, geometric means were not calculated. For the same chemical, LOD values sometimes change over time as a result of improvements to analytical methods. One possible consequence is that results reported as "< LOD" in the 1999–2000

data might be reported as a concentration value above the LOD in 2001–2002 or 2003–2004 because the analytical method had improved. Thus, for proper interpretation of LODs in the data tables, care must be taken to use the LOD that applies to the survey period. Percentile estimates (see below) that are less than the LOD for the chemical analysis were reported as “< LOD.”

For most chemicals, the LOD is constant for each specimen analyzed. Dioxins, furans, PCBs, organochlorine pesticides, and a few other pesticides are different: these have an individual LOD for each sample, mostly because the sample volume used for each analysis was different. A higher sample volume results in a lower LOD (i.e., a better ability to detect low levels). The maximum LOD values are given in each data table and in Appendix C. The maximum LOD was the highest LOD among all samples analyzed. Typically, the mean LOD is about 40%–50% of the maximum LOD. The same procedure for imputing values below the LOD in calculations of geometric means was used for chemicals with individual LODs for each sample. Concentrations less than the individual LOD were assigned a value equal to the individual LOD divided by the square root of two. When reporting percentiles for chemicals with individual sample LODs, if any sample LOD in the demographic group was above the percentile estimate, then the percentile estimate was not reported.

For chemicals measured in urine, separate tables are presented for the chemical concentration expressed per volume of urine (uncorrected table) and the chemical concentration expressed per gram of creatinine (creatinine corrected table). Geometric mean and percentile calculations were performed separately for each of these concentrations. LOD calculations were performed using the chemical concentration expressed per volume of urine, because this concentration determines the analytical sensitivity. For this reason, LOD results for urine measurements in each data table and in Appendix C are in units of weight per volume of urine. In the creatinine corrected tables, a result for a geometric mean or percentile was reported as < LOD if the corresponding geometric mean or percentile was < LOD in the table using weight per volume of urine. For example, if the 50th percentile for males was < LOD in the table using weight per volume of urine, it would also be < LOD in the creatinine corrected table.

For chemicals measured in serum lipid, separate tables are presented for the chemical concentration expressed per volume of serum (lipid unadjusted table) and the chemical concentration expressed per amount of lipid (lipid adjusted table). Geometric mean and percentile calculations were performed separately for each of these concentrations. LOD calculations were performed using the chemical concentration expressed per amount of lipid, because this concentration determines the analytical sensitivity. For this reason, LOD results for chemicals measured in each data table and in Appendix C are in weight per amount of lipid. In the lipid unadjusted tables, a result for a geometric mean or percentile was reported as < LOD if the corresponding geometric mean or percentile was < LOD in the lipid adjusted table.

Percentiles

Percentiles (50th, 75th, 90th, and 95th) provide additional information about the shape of the distribution. Percentile estimates and 95% confidence interval estimates that are less than the limit of detection are indicated as <LOD in the data tables. An explanation of the procedure for estimating percentiles is provided in Appendix A and example using SAS Callable SUDAAN is provided on the website (see “SAS Code Example” at: <https://www.cdc.gov/exposurereport/>).

Reference

Taylor JK. 1987. Quality assurance of chemical measurements. Boca Raton, FL: Lewis Publishers.

Interpretation of *Report* and *Updated Tables* Data: Important Factors

Research studies, separate from the *Report* and *Updated Tables*, are required to determine whether blood or urine levels are safe or are associated with disease or adverse effects.

The measurement of an environmental chemical in a person's blood or urine does not mean, by itself, that the chemical causes disease. Advances in analytical methods allow us to measure low levels of environmental chemicals in people, but separate studies of varying exposure levels and health effects are needed to determine whether blood or urine levels result in disease. These studies must also consider other factors such as duration of exposure. The *Report* and *Updated Tables* do not present new data on health risks from different exposures.

For some environmental chemicals, such as lead, research studies have given us a good understanding of the health risks associated with different blood levels. However, for many environmental chemicals, we need more research to assess health risks from different blood or urine levels. The results shown in the *Report* and *Updated Tables* should help prioritize and foster research on human health risks that result from exposure to environmental chemicals. For more information about exposure to environmental chemicals, see the section later in this document titled "Chemical and Toxicological Information", which includes Internet reference sites.

Persistent and non-persistent chemicals; Use of percentiles; Comparison of levels between groups

In the *Report* and *Updated Tables*, most measurements in urine quantify chemical metabolites of non-persistent chemicals (those that do not stay in the body a long time). Metals and some tobacco biomarkers (e.g., heterocyclic amines) measured in urine are exceptions for they are not metabolites. Persistent chemicals (those that stay in the body for a long time) are usually measured in serum as the parent chemical.

The higher percentiles (75th, 90th, 95th) provided for each chemical convey useful information about the upper distribution and range of levels in the population. The 95th percentile is helpful when determining whether levels observed in separate public health investigations or other studies are unusual.

Levels of chemicals are provided for the demographic groups as stratified by age, gender, and race/ethnicity. Demographic groups may not be equal in their composition with respect to other variables. Chemicals measured in pooled serum samples are stratified by combined demographic groups (e.g., non-Hispanic black females, ages 12-19 years). CDC scientists publish separate scientific papers that make detailed comparisons of levels of chemicals in different demographic groups. See <https://www.cdc.gov/exposurereport/> for a list of peer-reviewed biomonitoring papers.

Not all the chemicals in the *Report* and *Updated Tables* are measured in the same individuals. Therefore, it is not possible to determine the fraction of all measured chemicals that were found at detectable levels in a given person.

Blood, serum, and urine levels of a chemical should not be confused with levels of the chemical in air, water, food, soil, or dust.

Concentrations of environmental chemicals in blood or urine are not the same as those in air, water, food, soil, or dust. For example, a chemical concentration of 10 µg/L in water does not produce a level of 10 µg/L in blood or urine. Blood or urine levels may reflect exposure from one or more sources, including air, water, food, soil, and dust.

Levels of a chemical in blood, serum, and urine are determined by how much of the chemical has entered the body through all routes of exposure, including ingestion, inhalation, and dermal absorption, and how the chemical is distributed in body tissues, transformed into metabolites, and eliminated from

the body. Although the levels in the blood, serum and urine are measures of the amount of a chemical that has entered the body by all routes of exposure, the blood or urine level alone does not determine which exposure source or which route of exposure has occurred.

Calculation of Inorganic-related Arsenic Species

We present data for the urinary inorganic-related arsenic species. The values are calculated using results for each NHANES survey period for the following four arsenic species: arsenic (V) acid, arsenous (III) acid, dimethylarsinic acid (DMA), and monomethylarsonic acid (MMA). The sum of the four species is calculated for each individual NHANES participant. If the value of a species is less than the limit of detection (LOD), then the imputed value is used. The imputed value is calculated as the LOD divided by the square root of 2 (Hornung and Reed, 1990) and imputed values are provided in the NHANES public release file. If all four arsenic species are reported as less than the LOD, then the sum will be the sum of the four imputed values.

The geometric means, selected percentiles, and confidence intervals are calculated using sums with detectable values of 60 percent or higher. If the detection frequency for a category is less than 60 percent, this is indicated by an asterisk (*). There is no LOD for the inorganic-related arsenic species because the values are calculated, rather than measured.

Reference: Hornung RW, Reed LD. 1990. Estimation of average concentration in the presence of nondetectable values. *Appl Occup Environ Hyg* 5(1):46-51.

Calculation of PFOS and PFOA as the Sum of Isomers

Beginning with NHANES 2013-2014, we report results for both serum PFOS and PFOA as the sum of their respective isomers. This is because in 2013 we began measuring separately linear and branched isomers of both PFOS and PFOA and no longer measure total PFOS or PFOA. This calculated sum of PFOS (or PFOA) isomers is comparable to the total PFOS (or PFOA) reported before. Production of PFOS and PFOA employed electrochemical fluorination (ECF) or fluorotelomerization. ECF used from the 1950s until the early 2000s yielded branched and linear isomers. In contrast, fluorotelomerization produced almost exclusively linear compounds. Measurement of the two types of isomers may be informative because branched isomers may be eliminated from the body more rapidly than linear isomers (Benskin et al, 2009a). In addition, separate measurements may provide information that is helpful for evaluating exposure source contributions (Benskin et al, 2010, 2009b).

The value of PFOS is calculated as the sum of branched PFOS isomers (perfluoromethylheptane sulfonate isomers, Sm-PFOS) plus the linear isomer (*n*-PFOS). PFOA is calculated as the sum of branched PFOA isomers (Sb-PFOA) plus the linear isomer (*n*-PFOA). For each chemical (PFOS and PFOA), the sum of the branched and linear isomers is calculated for each individual NHANES participant. If the value for any isomer is below the limit of detection (LOD), then the imputed value is used. The imputed value is calculated as the LOD divided by the square root of 2 (Hornung and Reed, 1990) and imputed values are provided in the NHANES public release file. If both isomers for calculating either PFOS or PFOA are reported as less than the LOD, then two imputed values are summed. These calculated PFOA and PFOS results can be used to compare with previous measurements and examine trends in the U.S. population.

The geometric means, selected percentiles, and confidence intervals are calculated using sums with detectable values of 60 percent or higher. If the detection frequency for a category is less than 60 percent, this is indicated by an asterisk (*). Because the 2013-2014 and 2015-2016 values for PFOA and PFOS are a calculated sum, there is no limit of detection (LOD) for either of these two chemicals.

The branched isomers of PFOS (Sm-PFOS) and PFOA (Sb-PFOA) are a mixture of isomers. The isomers known to be included in Sm-PFOS are perfluoro-3-methylheptane sulfonate, perfluoro-4-methylheptane sulfonate, perfluoro-5-methylheptane sulfonate, and perfluoro-6-methylheptane sulfonate. The isomers known to be included in Sb-PFOA are perfluoro-3-methylheptanoic acid, perfluoro-4-methylheptanoic acid, perfluoro-5-methylheptanoic acid, perfluoro-6-methylheptanoic acid, perfluoro-4,4-dimethylhexanoic acid, perfluoro-5,5-dimethylhexanoic acid, perfluoro-3,5-dimethylhexanoic acid, and perfluoro-4,5-dimethylhexanoic acid. The linear isomers of PFOS (*n*-PFOS) and PFOA (*n*-PFOA) are single chemicals. Data tables are also presented for each of the four isomers that were measured.

References:

Benskin JP, Hold A, Martin JW. 2009a. Isomer-specific biotransformation rates of a perfluorooctane sulfonate (PFOS) precursor by cytochrome P450 isozymes and human liver microsomes. *Environ Sci Technol* 43:8566-8572.

Benskin JP, DeSilver AO, Martin LJ, Arsenault G, McCrindle R, Riddell N, et al. 2009b. Disposition of perfluorinated acid isomers in Sprague-Dawley rats: part 1: single dose. *Environ Toxicol Chem* 28:542-554.

Benskin JP, DeSilver AG, Martin JW. 2010. Isomer profiling of perfluorinated substances as a tool for source tracking: a review of early findings and future applications. *Rev Environ Contamin Toxicol* 208:111-160.

Hornung RW, Reed LD. 1990. Estimation of average concentration in the presence of nondetectable values. *Appl Occup Environ Hyg* 5(1):46-51.

Chemical and Toxicological Information

The *National Report on Human Exposure to Environmental Chemicals* and *Updated Tables* (referred to as the *Report* and *Updated Tables*, respectively) presents biomonitoring data on the exposure of the U.S. population to environmental chemicals. The measurement of an environmental chemical in a person's blood or urine does not mean, by itself, that the chemical causes disease or adverse effects. Advances in analytical methods allow us to measure lower and lower levels of environmental chemicals in people. Separate studies of varying exposure levels and health effects associated with these levels are required to determine whether blood, serum, and urine levels result in disease or adverse effects. The data and information in the *Report* and *Updated Tables* do not establish health effects nor do they create guidelines.

Where can I find more information?

For more information about environmental chemicals, web links are provided below. Links to nonfederal organizations are provided solely as a service to our readers. These links do not constitute an endorsement of these organizations or their programs by CDC or the federal government. CDC is not responsible for the content of an individual organization's Web pages found at these links.

U.S. Governmental Sources

Centers for Disease Control and Prevention (CDC)

National Center for Health Statistics (NCHS)

<https://www.cdc.gov/nchs/>

National Health and Nutrition Examination Survey (NHANES)

<https://www.cdc.gov/nchs/nhanes.htm>

National Institute for Occupational Safety and Health (NIOSH)

<https://www.cdc.gov/niosh/data/>

- Registry of Toxic Effects of Chemical Substances (RTECS)
<https://www.cdc.gov/niosh/rtecs/>

National Center for Environmental Health (NCEH)

<https://www.cdc.gov/nceh/>

National Biomonitoring Program

<https://www.cdc.gov/biomonitoring/>

Agency for Toxic Substances and Disease Registry (ATSDR)

Toxicological Profiles and ToxFAQs

- ToxFAQs
<https://www.atsdr.cdc.gov/toxfaqs/>
- Toxicological Profiles
<https://www.atsdr.cdc.gov/ToxProfiles/>

Toxic Substances Portal

<https://www.atsdr.cdc.gov/substances/>

U.S. Food and Drug Administration (FDA)

Center for Food Safety and Applied Nutrition

<https://www.fda.gov/AboutFDA/CentersOffices/OfficeofFoods/CFSAN/>

National Center for Toxicological Research

<https://www.fda.gov/AboutFDA/CentersOffices/OC/OfficeofScientificandMedicalPrograms/NCTR/>

U.S. Environmental Protection Agency (EPA)

Integrated Risk-Information System (IRIS)

<https://www.epa.gov/iris/>

Office of Chemical Safety and Pollution Prevention (OCSPP)

<https://www.epa.gov/aboutepa/about-office-chemical-safety-and-pollution-prevention-ocspp>

Office of Drinking Water

<https://www.epa.gov/ground-water-and-drinking-water>

U.S. Geological Survey (USGS)

<https://www.usgs.gov/>

U.S. Department of Agriculture (USDA)

Food Safety and Inspection Service

<https://www.fsis.usda.gov/wps/portal/fsis/home>

National Institutes of Health (NIH)

National Institute for Environmental Health Sciences (NIEHS)

<https://www.niehs.nih.gov/>

National Toxicology Program (NTP)

<http://ntp.niehs.nih.gov>

14th Report on Carcinogens

<https://ntp.niehs.nih.gov/pubhealth/roc/index-1.html>

National Library of Medicine (NLM), Toxicology Data Network

<https://toxnet.nlm.nih.gov/>

National Library of Medicine (NLM), Tox Town (Environmental Health Concerns and Toxic Chemicals Where You Live, Work, and Play)

<https://toxtown.nlm.nih.gov/>

National Library of Medicine (NLM), Environmental Health and Toxicology, online Toxicology Tutorial

<https://toxtutor.nlm.nih.gov/>

Professional and Academic Organizations

American Conference of Governmental Industrial Hygienists

<http://www.acgi.org/home>

Association of Public Health Laboratories

<http://www.aplh.org/>

Pediatric Environmental Health Specialty Units (PEHSUs)

<http://www.PEHSU.net/>

International Occupational Safety and Health

- Information Center International Chemical Safety Cards
http://www.ilo.org/safework/info/publications/WCMS_113134/lang--en/index.htm

The Extension TOXicology NETwork (EXTOXNET)

- Pesticide Information Profiles
<http://extoxnet.orst.edu/pips/ghindex.html>

World Health Organization

International Programme on Chemical Safety (IPCS)

<http://www.who.int/pes>

- Monographs of the Joint FAO/WHO Meeting on Pesticide Residues
<http://www.inchem.org/pages/jmpr.html>
- Environmental Health Criteria documents
<http://www.who.int/ipcs/publications/ehc/en/>

International Agency for Research on Cancer (IARC)

<https://www.iarc.fr/>

- Monographs on the Evaluation of Carcinogenic Risks to Humans
<https://monographs.iarc.fr/>

Acrylamide (2003 – 2006)

CAS Number 79-06-1

Geometric mean and selected percentiles of hemoglobin adduct concentrations (in pmol/g hemoglobin) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	61.2 (58.1-64.4)	54.8 (52.8-57.7)	79.1 (73.5-85.6)	141 (124-155)	192 (168-217)	7101
Total population (2005 - 2006)	61.6 (58.1-65.4)	54.8 (52.8-56.8)	79.1 (75.1-86.1)	165 (151-178)	221 (204-246)	7857
Age 3-5 years (2003 - 2004)	59.4 (53.6-65.7)	58.6 (51.7-64.9)	75.7 (63.4-83.6)	90.6 (81.9-105)	108 (86.2-118)	350
Age 3-5 years (2005 - 2006)	59.1 (55.8-62.6)	63.6 (58.6-66.4)	74.4 (73.2-76.3)	90.3 (80.8-100)	102 (87.3-121)	483
Age 6-11 years (2003 - 2004)	58.6 (56.1-61.2)	57.3 (55.2-59.7)	71.0 (67.4-76.3)	86.8 (81.2-91.4)	98.8 (91.0-104)	769
Age 6-11 years (2005 - 2006)	56.1 (53.9-58.5)	57.1 (54.8-59.9)	67.8 (65.3-69.8)	78.8 (74.9-86.8)	93.8 (81.1-103)	924
Age 12-19 years (2003 - 2004)	57.4 (54.4-60.5)	54.5 (52.1-57.4)	70.7 (65.6-75.7)	100 (89.2-114)	132 (115-151)	1889
Age 12-19 years (2005 - 2006)	56.4 (52.5-60.6)	53.1 (50.7-55.8)	69.5 (66.2-73.1)	112 (98.0-127)	162 (131-221)	1977
Age 20-59 years (2003 - 2004)	66.2 (62.2-70.6)	57.9 (54.6-61.1)	96.1 (83.6-108)	163 (147-191)	223 (194-243)	2570
Age 20-59 years (2005 - 2006)	66.8 (62.1-71.9)	56.4 (53.7-59.8)	101 (87.1-118)	196 (177-210)	257 (222-298)	3066
Age 60+ years (2003 - 2004)	50.1 (47.9-52.3)	46.5 (44.0-49.2)	61.0 (57.6-66.0)	96.1 (88.0-108)	141 (120-152)	1523
Age 60+ years (2005 - 2006)	52.5 (49.4-55.7)	47.8 (45.0-49.6)	65.9 (60.2-71.6)	136 (112-156)	184 (167-198)	1407
Males (2003 - 2004)	63.9 (60.2-67.9)	57.0 (53.7-60.1)	85.5 (79.2-93.7)	152 (139-175)	220 (189-237)	3509
Males (2005 - 2006)	65.7 (61.5-70.1)	57.5 (55.1-60.4)	91.5 (80.9-101)	183 (163-208)	246 (213-277)	3826
Females (2003 - 2004)	58.7 (55.9-61.5)	53.4 (51.8-55.9)	73.9 (69.5-80.6)	126 (111-142)	164 (147-191)	3592
Females (2005 - 2006)	58.1 (54.6-61.7)	52.8 (50.9-54.7)	73.1 (68.3-78.2)	146 (131-160)	199 (182-211)	4031
Mexican Americans (2003 - 2004)	61.7 (58.7-64.9)	57.4 (54.4-60.4)	73.0 (69.2-77.3)	101 (95.0-115)	149 (125-179)	1792
Mexican Americans (2005 - 2006)	57.2 (54.0-60.7)	54.8 (51.4-58.2)	70.2 (67.2-73.7)	94.0 (86.2-104)	130 (110-148)	2035
Non-Hispanic blacks (2003 - 2004)	63.8 (57.3-71.1)	57.1 (52.1-64.1)	86.5 (74.6-104)	156 (120-203)	218 (172-271)	1874
Non-Hispanic blacks (2005 - 2006)	58.1 (53.5-63.2)	54.2 (52.4-55.7)	82.3 (74.0-95.4)	170 (147-189)	226 (198-259)	2061
Non-Hispanic whites (2003 - 2004)	62.4 (59.0-66.0)	55.3 (53.0-58.6)	82.2 (75.4-89.1)	146 (129-163)	197 (172-223)	2994
Non-Hispanic whites (2005 - 2006)	63.9 (59.8-68.3)	55.4 (53.0-58.5)	83.8 (76.5-94.9)	177 (160-194)	228 (208-258)	3153

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 and 05-06 are 3.0 and 0.11, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Glycidamide (2003 – 2006)

CAS Number 486-56-6

Geometric mean and selected percentiles of hemoglobin adduct concentrations (in pmol/g hemoglobin) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	59.3 (56.7-62.1)	59.9 (57.6-62.5)	85.9 (81.6-90.5)	130 (120-141)	167 (153-181)	7278
Total population (2005 - 2006)	50.4 (46.9-54.1)	49.4 (46.5-52.4)	71.3 (67.1-75.6)	109 (98.4-120)	142 (130-151)	7740
Age 3-5 years (2003 - 2004)	71.6 (66.9-76.7)	71.1 (66.9-78.9)	94.7 (87.3-101)	118 (103-126)	126 (119-135)	411
Age 3-5 years (2005 - 2006)	66.7 (61.5-72.2)	72.9 (65.9-76.3)	89.4 (82.8-96.8)	107 (104-113)	120 (109-129)	482
Age 6-11 years (2003 - 2004)	74.1 (70.3-78.2)	75.0 (70.9-77.9)	95.6 (90.4-103)	121 (112-134)	141 (126-157)	784
Age 6-11 years (2005 - 2006)	58.2 (55.4-61.2)	59.6 (57.3-61.8)	73.7 (70.0-77.5)	90.8 (81.3-99.8)	106 (93.8-113)	907
Age 12-19 years (2003 - 2004)	55.4 (51.1-60.1)	59.2 (56.1-62.1)	79.2 (72.7-86.7)	113 (94.9-138)	146 (123-169)	1931
Age 12-19 years (2005 - 2006)	48.2 (45.1-51.6)	47.3 (44.8-49.3)	64.1 (60.5-67.9)	92.0 (82.8-103)	123 (103-149)	1944
Age 20-59 years (2003 - 2004)	62.5 (59.4-65.8)	60.9 (58.7-64.4)	90.7 (84.4-98.2)	143 (130-159)	187 (169-204)	2623
Age 20-59 years (2005 - 2006)	52.3 (47.9-57.1)	50.1 (46.3-54.2)	74.5 (69.5-80.9)	121 (107-134)	154 (140-179)	3025
Age 60+ years (2003 - 2004)	45.5 (42.8-48.3)	46.8 (44.8-49.3)	65.2 (63.5-66.9)	96.4 (90.0-103)	129 (111-141)	1529
Age 60+ years (2005 - 2006)	40.9 (38.1-44.0)	39.5 (37.4-42.7)	56.7 (51.1-63.8)	88.7 (75.7-103)	118 (103-133)	1382
Males (2003 - 2004)	59.5 (56.9-62.3)	59.4 (56.8-61.8)	87.1 (82.5-92.3)	136 (123-148)	174 (157-197)	3604
Males (2005 - 2006)	50.8 (46.9-55.0)	49.4 (46.1-53.2)	74.5 (70.2-78.8)	113 (102-127)	148 (131-165)	3761
Females (2003 - 2004)	59.1 (56.0-62.5)	60.4 (57.5-64.0)	85.0 (80.2-90.0)	125 (116-135)	159 (143-175)	3674
Females (2005 - 2006)	50.0 (46.7-53.6)	49.2 (46.5-52.3)	68.3 (63.9-73.2)	101 (93.8-114)	136 (125-145)	3979
Mexican Americans (2003 - 2004)	64.7 (61.2-68.4)	65.4 (61.1-70.1)	87.4 (81.5-94.4)	118 (110-129)	152 (135-170)	1841
Mexican Americans (2005 - 2006)	50.3 (46.5-54.4)	50.7 (46.8-54.8)	66.1 (61.6-70.5)	86.6 (80.6-95.8)	106 (98.1-114)	2022
Non-Hispanic blacks (2003 - 2004)	53.8 (51.1-56.7)	56.0 (52.4-59.7)	83.0 (75.2-91.5)	121 (108-140)	159 (129-204)	1954
Non-Hispanic blacks (2005 - 2006)	42.3 (38.9-46.0)	44.1 (41.7-45.9)	64.0 (60.3-67.8)	99.9 (87.2-109)	129 (117-140)	2008
Non-Hispanic whites (2003 - 2004)	61.1 (57.6-64.9)	60.7 (57.9-64.2)	87.5 (83.0-93.5)	136 (124-149)	172 (157-194)	3044
Non-Hispanic whites (2005 - 2006)	52.5 (48.5-56.9)	50.7 (46.8-55.0)	74.5 (69.9-80.1)	115 (102-129)	147 (134-160)	3110

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 and 05-06 are 4.0 and 0.66, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Serum Cotinine (1999 – 2010)

CAS Number 486-56-6

Metabolite of nicotine

Geometric mean and selected percentiles of serum concentrations (in ng/mL) for the ***non-smoking U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	.060 (<LOD-.080)	.240 (.190-.302)	1.02 (.770-1.28)	1.96 (1.60-2.62)	5999
Total population (2001 - 2002**)	.062 (.050-.077)	< LOD	.160 (.120-.220)	.930 (.740-1.17)	2.20 (1.83-2.44)	6819
Total population (2003 - 2004)	.071 (.057-.089)	.050 (.040-.070)	.210 (.140-.310)	.990 (.740-1.30)	2.17 (1.81-2.54)	6320
Total population (2005 - 2006)	.054 (.047-.061)	.040 (.030-.040)	.120 (.100-.150)	.630 (.460-.870)	1.47 (1.15-1.92)	6347
Total population (2007 - 2008)	.057 (.048-.068)	.040 (.030-.040)	.130 (.100-.180)	.760 (.550-1.09)	1.81 (1.45-2.43)	6197
Total population (2009 - 2010)	.041 (.037-.046)	.030 (.020-.030)	.070 (.070-.090)	.450 (.350-.580)	1.29 (1.04-1.61)	6678
Age 3-11 years (1999 - 2000)	.164 (.115-.234)	.110 (.066-.188)	.500 (.260-1.16)	1.88 (.997-3.44)	3.44 (1.42-4.79)	1174
Age 3-11 years (2001 - 2002**)	.110 (.076-.160)	.070 (<LOD-.130)	.570 (.310-1.00)	2.23 (1.63-2.78)	3.23 (2.53-4.01)	1415
Age 3-11 years (2003 - 2004)	.137 (.088-.213)	.120 (.060-.220)	.620 (.310-1.20)	2.04 (1.38-2.94)	3.35 (2.12-4.68)	1252
Age 3-11 years (2005 - 2006)	.078 (.062-.097)	.050 (.040-.070)	.220 (.160-.350)	1.22 (.880-1.82)	2.42 (1.63-3.46)	1296
Age 3-11 years (2007 - 2008)	.095 (.067-.136)	.060 (.040-.100)	.380 (.170-.840)	1.67 (1.10-2.54)	2.81 (2.26-3.54)	1337
Age 3-11 years (2009 - 2010)	.060 (.047-.075)	.040 (.030-.050)	.160 (.110-.250)	.920 (.560-1.58)	2.15 (1.35-3.00)	1355
Age 12-19 years (1999 - 2000)	.163 (.142-.187)	.110 (.080-.163)	.540 (.428-.660)	1.66 (1.50-1.95)	2.62 (2.09-3.39)	1773
Age 12-19 years (2001 - 2002**)	.086 (.059-.126)	.050 (<LOD-.110)	.350 (.190-.580)	1.53 (1.09-2.12)	3.12 (2.47-3.99)	1902
Age 12-19 years (2003 - 2004)	.110 (.087-.139)	.080 (.060-.120)	.510 (.350-.670)	1.55 (1.21-1.93)	2.68 (1.96-4.02)	1783
Age 12-19 years (2005 - 2006)	.074 (.060-.092)	.050 (.040-.060)	.230 (.150-.350)	1.16 (.860-1.69)	2.26 (1.69-2.72)	1714
Age 12-19 years (2007 - 2008)	.081 (.061-.106)	.050 (.030-.070)	.350 (.170-.550)	1.25 (.930-1.99)	2.54 (2.04-2.94)	934
Age 12-19 years (2009 - 2010)	.056 (.044-.072)	.030 (.020-.040)	.130 (.080-.230)	.980 (.510-1.80)	2.49 (1.31-3.65)	1042
Age 20+ years (1999 - 2000)	*	.050 (<LOD-.061)	.167 (.140-.193)	.630 (.533-.820)	1.50 (1.28-1.66)	3052
Age 20+ years (2001 - 2002**)	.052 (<LOD-.063)	< LOD	.110 (.090-.150)	.630 (.470-.790)	1.42 (1.14-1.89)	3502
Age 20+ years (2003 - 2004)	.058 (.047-.071)	.040 (.030-.050)	.140 (.100-.200)	.630 (.480-.840)	1.54 (1.26-1.92)	3285
Age 20+ years (2005 - 2006)	.047 (.042-.053)	.030 (.030-.040)	.100 (.080-.120)	.440 (.310-.620)	1.14 (.870-1.41)	3337
Age 20+ years (2007 - 2008)	.049 (.043-.057)	.030 (.030-.040)	.100 (.080-.120)	.490 (.390-.640)	1.37 (.970-1.70)	3926
Age 20+ years (2009 - 2010)	.037 (.034-.040)	.020 (.020-.030)	.070 (.060-.070)	.310 (.240-.390)	.990 (.700-1.24)	4281
Males (1999 - 2000)	.124 (.106-.145)	.080 (.060-.110)	.308 (.220-.410)	1.20 (.950-1.49)	2.39 (1.66-3.22)	2789
Males (2001 - 2002**)	.075 (.059-.094)	.050 (<LOD-.070)	.230 (.160-.320)	1.17 (.960-1.49)	2.44 (2.23-2.99)	3152
Males (2003 - 2004)	.087 (.070-.108)	.060 (.040-.080)	.280 (.190-.360)	1.23 (.910-1.68)	2.63 (2.09-3.19)	2937
Males (2005 - 2006)	.064 (.055-.074)	.040 (.040-.050)	.150 (.120-.190)	.720 (.550-1.07)	1.85 (1.42-2.24)	2922
Males (2007 - 2008)	.068 (.056-.081)	.040 (.040-.050)	.170 (.120-.240)	1.07 (.690-1.39)	2.52 (1.84-2.92)	2948
Males (2009 - 2010)	.046 (.042-.051)	.030 (.030-.030)	.080 (.070-.100)	.550 (.410-.700)	1.60 (1.19-2.38)	3181
Females (1999 - 2000)	*	< LOD	.180 (.148-.230)	.850 (.600-1.14)	1.85 (1.33-2.45)	3210
Females (2001 - 2002**)	.053 (<LOD-.066)	< LOD	.120 (.090-.180)	.710 (.540-.990)	1.77 (1.32-2.20)	3667
Females (2003 - 2004)	.060 (.047-.077)	.040 (.030-.060)	.160 (.110-.260)	.860 (.580-1.15)	1.76 (1.32-2.22)	3383
Females (2005 - 2006)	.047 (.040-.054)	.030 (.030-.040)	.100 (.070-.130)	.510 (.300-.830)	1.23 (1.04-1.52)	3425
Females (2007 - 2008)	.050 (.042-.059)	.030 (.030-.040)	.110 (.080-.150)	.630 (.400-.900)	1.40 (1.09-1.87)	3249
Females (2009 - 2010)	.037 (.033-.042)	.020 (.020-.030)	.070 (.050-.080)	.380 (.270-.570)	1.03 (.720-1.61)	3497

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.05, 0.05, 0.015, 0.015, 0.015, and 0.015, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**In the 2001-2002 survey period, 83% of measurements had an LOD of 0.015 ng/mL, and 17% had an LOD of 0.05 ng/mL.

***Non-smoking is defined as a serum cotinine concentration of 10 ng/mL or less.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cotinine_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cotinine_FactSheet.html

Serum Cotinine (1999 – 2010)

CAS Number 486-56-6

Metabolite of nicotine

Geometric mean and selected percentiles of serum concentrations (in ng/mL) for the ***non-smoking U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	.140 (.110-.180)	.506 (.370-.726)	1.21 (.900-1.70)	2241
Mexican Americans (2001 - 2002**)	.060 (<LOD-.084)	< LOD	.160 (.080-.310)	.730 (.480-1.19)	2.12 (1.19-2.96)	1878
Mexican Americans (2003 - 2004)	.054 (.043-.068)	.030 (.020-.050)	.120 (.080-.180)	.690 (.430-1.00)	2.65 (1.87-3.57)	1707
Mexican Americans (2005 - 2006)	.047 (.038-.059)	.030 (.020-.040)	.100 (.070-.150)	.500 (.370-.730)	1.54 (.830-2.49)	1807
Mexican Americans (2007 - 2008)	.044 (.033-.057)	.030 (.020-.040)	.080 (.060-.120)	.480 (.290-.880)	1.59 (1.00-3.07)	1412
Mexican Americans (2009 - 2010)	.038 (.032-.045)	.020 (.020-.030)	.060 (.050-.080)	.360 (.230-.640)	1.35 (.710-2.25)	1615
Non-Hispanic blacks (1999 - 2000)	.175 (.153-.201)	.131 (.111-.150)	.505 (.400-.625)	1.43 (1.21-1.75)	2.34 (1.84-3.50)	1333
Non-Hispanic blacks (2001 - 2002**)	.164 (.137-.197)	.130 (.110-.160)	.580 (.450-.770)	1.77 (1.55-2.05)	3.15 (2.50-4.30)	1602
Non-Hispanic blacks (2003 - 2004)	.144 (.104-.198)	.120 (.080-.180)	.520 (.350-.770)	1.54 (1.20-2.14)	2.77 (2.18-3.54)	1704
Non-Hispanic blacks (2005 - 2006)	.114 (.085-.153)	.080 (.060-.120)	.440 (.240-.690)	1.42 (.900-2.03)	2.45 (1.70-3.70)	1630
Non-Hispanic blacks (2007 - 2008)	.094 (.079-.112)	.060 (.050-.090)	.320 (.250-.390)	1.19 (.980-1.46)	2.37 (1.75-2.88)	1244
Non-Hispanic blacks (2009 - 2010)	.095 (.074-.122)	.070 (.050-.090)	.320 (.210-.540)	1.33 (.900-2.05)	2.85 (1.97-3.60)	1129
Non-Hispanic whites (1999 - 2000)	*	.050 (<LOD-.073)	.216 (.154-.312)	.950 (.621-1.40)	1.92 (1.48-3.02)	1950
Non-Hispanic whites (2001 - 2002**)	.052 (<LOD-.068)	< LOD	.120 (.090-.180)	.800 (.570-1.11)	1.88 (1.48-2.30)	2847
Non-Hispanic whites (2003 - 2004)	.066 (.050-.087)	.040 (.030-.070)	.180 (.120-.300)	.920 (.620-1.32)	2.01 (1.70-2.49)	2500
Non-Hispanic whites (2005 - 2006)	.049 (.042-.056)	.030 (.030-.040)	.100 (.080-.130)	.530 (.330-.800)	1.27 (.980-1.62)	2404
Non-Hispanic whites (2007 - 2008)	.056 (.043-.073)	.040 (.030-.050)	.130 (.080-.240)	.750 (.440-1.27)	1.70 (1.24-2.54)	2485
Non-Hispanic whites (2009 - 2010)	.037 (.033-.043)	.020 (.020-.030)	.070 (.050-.080)	.350 (.240-.560)	1.06 (.780-1.60)	2743

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.05, 0.05, 0.015, 0.015, 0.015, and 0.015, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**In the 2001-2002 survey period, 83% of measurements had an LOD of 0.015 ng/mL, and 17% had an LOD of 0.05 ng/mL.

***Non-smoking is defined as a serum cotinine concentration of 10 ng/mL or less.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cotinine_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cotinine_FactSheet.html

Serum Cotinine (2011 – 2014)

CAS Number 486-56-6

Metabolite of nicotine

Geometric mean and selected percentiles of serum concentrations (in ng/mL) for the ***non-smoking U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	.020 (.018-.023)	.059 (.049-.072)	.356 (.263-.500)	1.30 (.882-1.60)	6108
Total population (2013 - 2014)	*	.017 (<LOD-.021)	.057 (.042-.082)	.388 (.246-.605)	1.53 (1.06-1.90)	6561
Age 3-11 years (2011 - 2012)	.058 (.045-.074)	.031 (.024-.045)	.172 (.100-.313)	1.02 (.627-1.94)	2.49 (1.56-3.36)	1348
Age 3-11 years (2013 - 2014)	.048 (.036-.065)	.021 (.015-.039)	.128 (.081-.239)	.962 (.471-1.70)	2.15 (1.44-3.33)	1445
Age 12-19 years (2011 - 2012)	.049 (.040-.061)	.025 (.020-.037)	.147 (.083-.235)	.711 (.520-1.06)	1.47 (1.05-2.29)	990
Age 12-19 years (2013 - 2014)	*	.023 (.016-.033)	.129 (.067-.246)	1.14 (.579-2.19)	2.87 (1.90-4.51)	1129
Age 20+ years (2011 - 2012)	*	.019 (.016-.020)	.047 (.040-.053)	.210 (.176-.263)	.835 (.566-1.38)	3770
Age 20+ years (2013 - 2014)	*	.016 (<LOD-.019)	.047 (.037-.061)	.244 (.149-.380)	.861 (.605-1.64)	3987
Males (2011 - 2012)	.041 (.037-.045)	.023 (.020-.026)	.076 (.065-.095)	.530 (.397-.715)	1.76 (1.35-2.42)	2903
Males (2013 - 2014)	*	.018 (.016-.024)	.068 (.049-.095)	.491 (.341-.743)	1.84 (1.35-2.41)	3063
Females (2011 - 2012)	*	.019 (.016-.021)	.048 (.040-.059)	.244 (.189-.314)	.819 (.572-1.31)	3205
Females (2013 - 2014)	*	.016 (<LOD-.020)	.049 (.036-.075)	.309 (.182-.482)	1.15 (.722-1.71)	3498
Mexican Americans (2011 - 2012)	.033 (.027-.042)	.021 (.016-.027)	.055 (.040-.081)	.230 (.106-.386)	.668 (.349-2.07)	886
Mexican Americans (2013 - 2014)	*	.016 (<LOD-.019)	.045 (.034-.056)	.144 (.104-.316)	.550 (.362-1.24)	1261
Non-Hispanic blacks (2011 - 2012)	.076 (.054-.107)	.045 (.032-.071)	.259 (.127-.513)	1.10 (.678-2.02)	2.86 (1.46-4.20)	1576
Non-Hispanic blacks (2013 - 2014)	.086 (.070-.106)	.052 (.041-.073)	.296 (.236-.394)	1.70 (1.26-2.16)	3.17 (2.50-3.97)	1297
Non-Hispanic whites (2011 - 2012)	*	.017 (<LOD-.020)	.048 (.039-.061)	.277 (.207-.363)	1.10 (.627-1.50)	1841
Non-Hispanic whites (2013 - 2014)	*	< LOD	.044 (.029-.075)	.287 (.137-.602)	1.09 (.687-1.84)	2309
All Hispanics (2011 - 2012)	.033 (.028-.040)	.021 (.017-.026)	.054 (.041-.074)	.233 (.123-.387)	.834 (.377-2.37)	1587
All Hispanics (2013 - 2014)	*	.017 (.015-.020)	.048 (.038-.060)	.239 (.140-.378)	.905 (.486-1.78)	1926
Asians (2011 - 2012)	.030 (.026-.035)	.023 (.020-.027)	.046 (.037-.058)	.123 (.083-.201)	.308 (.201-.594)	878
Asians (2013 - 2014)	.030 (.026-.036)	.021 (.017-.025)	.052 (.041-.063)	.140 (.091-.250)	.475 (.244-.841)	766

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.015 and 0.015, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

***Non-smoking is defined as a serum cotinine concentration of 10 ng/mL or less.

*Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cotinine_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cotinine_FactSheet.html

Serum Hydroxycotinine (2013 – 2014)

CAS Number 486-56-6

Metabolite of nicotine

Geometric mean and selected percentiles of serum concentrations (in ng/mL) for the ***non-smoking U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	.023 (.018-.032)	.121 (.086-.232)	.553 (.425-.782)	6561
Age 3-11 years (2013 - 2014)	*	< LOD	.044 (.028-.070)	.314 (.161-.531)	.667 (.462-.984)	1445
Age 12-19 years (2013 - 2014)	*	< LOD	.038 (.020-.073)	.407 (.181-.662)	.848 (.447-1.39)	1129
Age 20+ years (2013 - 2014)	*	< LOD	.020 (.016-.025)	.088 (.063-.140)	.437 (.260-.744)	3987
Males (2013 - 2014)	*	< LOD	.024 (.018-.034)	.168 (.099-.286)	.673 (.489-.978)	3063
Females (2013 - 2014)	*	< LOD	.022 (.017-.030)	.095 (.070-.188)	.447 (.308-.677)	3498
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.058 (.038-.105)	.224 (.118-.437)	1261
Non-Hispanic blacks (2013 - 2014)	*	.015 (<LOD-.019)	.085 (.059-.116)	.476 (.314-.612)	.881 (.688-1.10)	1297
Non-Hispanic whites (2013 - 2014)	*	< LOD	.021 (.015-.033)	.095 (.066-.254)	.588 (.330-.896)	2309
All Hispanics (2013 - 2014)	*	< LOD	.015 (<LOD-.021)	.083 (.050-.141)	.378 (.192-.498)	1926
Asians (2013 - 2014)	*	< LOD	.015 (<LOD-.019)	.040 (.032-.051)	.115 (.052-.388)	766

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.015.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

***Non-smoking is defined as a serum cotinine concentration of 10 ng/mL or less.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cotinine_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cotinine_FactSheet.html

Urinary NNAL (4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol) (2007 – 2010)

CAS Number 76014-81-8

Metabolite of (4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone) (NNK)

Geometric mean and selected percentiles of urine concentrations (in pg/mL) for the **non-smoking U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	2.80 (2.20-3.70)	11.1 (8.80-14.4)	24.5 (18.0-30.4)	5212
Total population (2009 - 2010)	*	< LOD	1.90 (1.60-2.40)	7.30 (6.40-8.50)	16.7 (13.9-19.6)	6067
Age 6-11 years (2007 - 2008)	*	1.30 (.600-2.60)	8.50 (4.70-13.8)	31.4 (17.5-49.8)	60.6 (37.1-75.7)	875
Age 6-11 years (2009 - 2010)	*	.600 (<LOD-1.00)	3.10 (2.20-5.00)	15.5 (10.4-22.8)	29.3 (18.1-59.4)	937
Age 12-19 years (2007 - 2008)	*	1.20 (.600-2.10)	5.00 (3.80-9.20)	20.0 (11.9-27.5)	39.1 (20.6-60.9)	843
Age 12-19 years (2009 - 2010)	*	.900 (<LOD-1.50)	3.70 (2.70-5.20)	12.5 (6.90-25.5)	29.1 (13.9-51.4)	1004
Age 20+ years (2007 - 2008)	*	< LOD	2.10 (1.70-2.50)	8.20 (6.90-9.80)	16.6 (13.9-21.5)	3494
Age 20+ years (2009 - 2010)	*	< LOD	1.60 (1.30-1.90)	6.10 (5.10-6.90)	13.1 (10.7-15.8)	4126
Males (2007 - 2008)	*	< LOD	3.80 (3.00-4.50)	12.6 (10.6-15.0)	27.5 (18.9-38.1)	2463
Males (2009 - 2010)	*	< LOD	2.40 (1.90-3.00)	8.30 (7.20-9.90)	19.3 (15.2-22.5)	2903
Females (2007 - 2008)	*	< LOD	2.10 (1.50-2.90)	9.70 (7.10-13.6)	21.6 (16.6-28.0)	2749
Females (2009 - 2010)	*	< LOD	1.60 (1.30-1.90)	6.50 (4.70-8.80)	14.0 (10.7-19.0)	3164
Mexican Americans (2007 - 2008)	*	< LOD	2.00 (1.20-3.10)	6.90 (4.90-9.00)	13.9 (10.8-17.3)	1206
Mexican Americans (2009 - 2010)	*	< LOD	1.60 (1.20-2.20)	4.90 (3.70-7.00)	11.1 (5.70-18.4)	1476
Non-Hispanic blacks (2007 - 2008)	*	.800 (<LOD-1.90)	4.90 (3.60-6.30)	14.0 (11.6-17.2)	26.1 (18.5-33.2)	1057
Non-Hispanic blacks (2009 - 2010)	1.81 (1.30-2.54)	1.40 (<LOD-2.40)	5.90 (3.80-8.10)	18.9 (11.7-26.1)	34.0 (18.9-61.9)	1004
Non-Hispanic whites (2007 - 2008)	*	< LOD	2.80 (1.90-4.10)	11.9 (8.20-17.7)	27.5 (19.6-35.4)	2047
Non-Hispanic whites (2009 - 2010)	*	< LOD	1.80 (1.40-2.40)	6.80 (5.40-8.40)	15.2 (11.9-19.3)	2514

Limit of detection (LOD, see Data Analysis section) for Survey years 07-08 and 09-10 are 0.6 and 0.6 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**Non-smoking is defined as a serum cotinine concentration of 10 ng/mL or less.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/NNAL_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/NNAL_FactSheet.html

Urinary NNAL (4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol) (2011 – 2012)

CAS Number 76014-81-8

Metabolite of (4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone) (NNK)

Geometric mean and selected percentiles of urine concentrations (in pg/mL) for the **non-smoking U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	.800 (.700-.900)	2.30 (2.00-2.60)	7.40 (6.10-8.90)	15.7 (11.7-21.0)	5486
Age 6-11 years (2011 - 2012)	1.91 (1.57-2.32)	1.30 (1.10-1.70)	5.10 (3.80-7.30)	21.1 (11.5-31.9)	36.7 (20.1-60.2)	955
Age 12-19 years (2011 - 2012)	1.53 (1.35-1.73)	1.30 (1.10-1.40)	3.10 (2.20-4.30)	10.8 (7.60-14.4)	19.3 (13.2-27.0)	949
Age 20+ years (2011 - 2012)	*	.700 (.600-.900)	2.00 (1.80-2.20)	5.70 (4.80-6.80)	11.7 (10.0-14.9)	3582
Males (2011 - 2012)	1.32 (1.23-1.41)	1.00 (.900-1.10)	2.80 (2.40-3.10)	9.80 (7.60-11.2)	19.5 (13.5-26.4)	2616
Females (2011 - 2012)	*	.700 (.600-.800)	1.90 (1.70-2.20)	5.70 (4.60-7.20)	12.4 (9.00-18.5)	2870
Mexican Americans (2011 - 2012)	1.12 (.956-1.30)	.900 (.700-1.20)	1.90 (1.50-2.50)	5.30 (3.70-7.40)	9.50 (7.70-15.0)	775
Non-Hispanic blacks (2011 - 2012)	1.98 (1.57-2.48)	1.60 (1.30-2.10)	5.10 (3.30-8.70)	15.9 (9.40-28.8)	30.4 (18.5-46.7)	1393
Non-Hispanic whites (2011 - 2012)	*	.800 (.600-.900)	2.10 (1.80-2.40)	6.70 (5.30-8.50)	14.4 (11.4-20.4)	1679
Asians (2011 - 2012)	*	.600 (<LOD-.700)	1.20 (1.00-1.50)	2.80 (1.90-3.80)	5.00 (3.40-6.80)	814

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.6.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**Non-smoking is defined as a serum cotinine of 10 ng/mL or less.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/NNAL_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/NNAL_FactSheet.html

Urinary NNAL (4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol) (creatinine corrected) (2007 – 2010)

CAS Number 76014-81-8

Metabolite of (4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone) (NNK)

Geometric mean and selected percentiles of urine concentrations (in pg/mg of creatinine) for the **non-smoking U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	2.79 (2.31-3.50)	10.3 (7.36-14.0)	20.5 (16.4-27.5)	5210
Total population (2009 - 2010)	*	< LOD	2.05 (1.88-2.28)	6.40 (5.71-7.41)	14.6 (11.5-17.3)	6066
Age 6-11 years (2007 - 2008)	*	2.15 (1.38-3.22)	10.7 (5.95-17.9)	38.3 (21.2-57.1)	60.9 (46.4-72.1)	875
Age 6-11 years (2009 - 2010)	*	1.19 (<LOD-1.52)	4.25 (2.88-6.37)	19.2 (11.0-28.8)	37.2 (22.9-53.0)	936
Age 12-19 years (2007 - 2008)	*	1.14 (.710-1.75)	4.40 (2.59-7.36)	14.2 (10.5-23.1)	29.2 (15.6-41.9)	841
Age 12-19 years (2009 - 2010)	*	1.05 (<LOD-1.26)	3.08 (1.96-4.37)	10.0 (6.02-15.2)	20.7 (12.3-30.2)	1004
Age 20+ years (2007 - 2008)	*	< LOD	2.34 (2.00-2.73)	6.82 (5.49-8.65)	15.1 (11.8-17.7)	3494
Age 20+ years (2009 - 2010)	*	< LOD	1.84 (1.71-2.00)	5.21 (4.57-6.07)	11.4 (8.42-14.1)	4126
Males (2007 - 2008)	*	< LOD	2.98 (2.39-3.71)	10.5 (7.57-12.9)	20.9 (15.7-29.0)	2462
Males (2009 - 2010)	*	< LOD	2.00 (1.86-2.25)	6.61 (6.00-7.83)	15.1 (11.7-19.8)	2902
Females (2007 - 2008)	*	< LOD	2.67 (2.14-3.37)	9.87 (6.79-14.9)	20.0 (15.7-27.9)	2748
Females (2009 - 2010)	*	< LOD	2.09 (1.82-2.36)	6.15 (4.88-8.21)	12.7 (9.26-17.3)	3164
Mexican Americans (2007 - 2008)	*	< LOD	2.16 (1.55-3.00)	5.91 (4.32-8.30)	13.3 (8.36-17.9)	1205
Mexican Americans (2009 - 2010)	*	< LOD	1.73 (1.36-2.11)	5.00 (3.72-6.84)	10.0 (6.79-14.7)	1476
Non-Hispanic blacks (2007 - 2008)	*	.960 (<LOD-1.42)	3.70 (2.50-5.31)	11.5 (9.18-14.2)	20.8 (14.5-28.8)	1056
Non-Hispanic blacks (2009 - 2010)	1.40 (.982-2.01)	1.21 (<LOD-2.06)	3.96 (2.78-5.99)	12.2 (7.29-20.3)	23.4 (14.3-35.4)	1003
Non-Hispanic whites (2007 - 2008)	*	< LOD	2.93 (2.22-4.00)	11.4 (7.22-17.1)	23.9 (17.1-32.0)	2047
Non-Hispanic whites (2009 - 2010)	*	< LOD	1.96 (1.82-2.15)	6.09 (5.00-7.83)	14.7 (10.0-18.2)	2514

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**Non-smoking is defined as a serum cotinine concentration of 10 ng/mL or less.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/NNAL_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/NNAL_FactSheet.html

Urinary NNAL (4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol) (creatinine corrected) (2011 – 2012)

CAS Number 76014-81-8

Metabolite of (4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone) (NNK)

Geometric mean and selected percentiles of urine concentrations (in pg/mg of creatinine) for the **non-smoking U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	1.06 (1.00-1.14)	2.47 (2.14-2.72)	6.57 (5.24-8.25)	14.3 (11.7-18.4)	5483
Age 6-11 years (2011 - 2012)	2.57 (2.13-3.10)	1.91 (1.60-2.47)	5.93 (4.21-8.49)	23.5 (13.7-31.6)	39.1 (23.5-59.0)	954
Age 12-19 years (2011 - 2012)	1.45 (1.31-1.60)	1.14 (1.05-1.25)	3.40 (2.50-3.99)	9.14 (5.71-13.4)	18.4 (12.2-22.2)	949
Age 20+ years (2011 - 2012)	*	1.00 (.938-1.08)	2.12 (1.91-2.42)	5.00 (4.26-6.18)	10.5 (8.56-13.0)	3580
Males (2011 - 2012)	1.19 (1.10-1.29)	.984 (.909-1.05)	2.38 (2.08-2.68)	7.36 (5.60-9.33)	15.2 (11.5-21.4)	2615
Females (2011 - 2012)	*	1.18 (1.04-1.30)	2.48 (2.17-2.86)	5.67 (4.69-8.21)	13.5 (10.3-18.0)	2868
Mexican Americans (2011 - 2012)	1.15 (.985-1.35)	1.03 (.860-1.22)	1.94 (1.67-2.35)	4.72 (3.51-6.74)	9.93 (6.46-15.9)	775
Non-Hispanic blacks (2011 - 2012)	1.50 (1.18-1.91)	1.31 (1.02-1.63)	3.70 (2.36-6.09)	11.5 (6.69-19.0)	19.7 (11.5-33.7)	1392
Non-Hispanic whites (2011 - 2012)	*	1.04 (.984-1.14)	2.47 (2.06-2.79)	5.94 (5.14-7.72)	16.1 (11.5-18.9)	1677
Asians (2011 - 2012)	*	.972 (<LOD-1.17)	1.82 (1.56-2.24)	3.57 (2.86-4.79)	5.71 (4.29-8.57)	814

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**Non-smoking is defined as a serum cotinine of 10 ng/mL or less.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/NNAL_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/NNAL_FactSheet.html

Blood Bromodichloromethane (2001 – 2010)

CAS Number 75-27-4

Geometric mean and selected percentiles of whole blood concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	2.21 (1.65-2.97)	2.30 (1.56-3.21)	4.63 (3.24-6.20)	8.45 (5.86-12.0)	12.0 (7.68-19.2)	785
Total population (2003 - 2004)	1.50 (1.20-1.86)	1.40 (1.10-1.90)	3.40 (2.60-4.20)	6.20 (5.30-7.00)	9.50 (7.00-12.0)	1322
Total population (2005 - 2006)	1.41 (1.09-1.83)	1.30 (.880-1.80)	3.00 (2.10-4.40)	6.30 (4.30-9.70)	10.0 (6.80-14.0)	3139
Total population (2007 - 2008)	1.52 (1.24-1.86)	1.42 (1.05-1.90)	3.13 (2.50-4.20)	6.42 (4.70-8.30)	9.59 (7.05-14.6)	2982
Total population (2009 - 2010)	1.61 (1.23-2.10)	1.44 (.911-2.33)	3.84 (2.64-5.33)	7.89 (6.36-9.58)	12.0 (9.65-14.5)	3275
Age 12-19 years (2005 - 2006)	1.23 (.954-1.58)	1.00 (.620-1.60)	2.80 (1.70-4.10)	5.50 (4.10-7.20)	8.20 (6.20-12.0)	932
Age 12-19 years (2007 - 2008)	1.49 (1.19-1.86)	1.26 (.910-1.88)	3.10 (2.42-4.05)	6.20 (4.13-8.52)	9.02 (6.20-15.0)	482
Age 12-19 years (2009 - 2010)	1.62 (1.21-2.18)	1.42 (.912-2.34)	3.84 (2.56-5.82)	8.41 (5.45-12.7)	13.0 (8.78-18.0)	558
Age 20-59 years (2001 - 2002)	2.21 (1.65-2.97)	2.30 (1.56-3.21)	4.63 (3.24-6.20)	8.45 (5.86-12.0)	12.0 (7.68-19.2)	785
Age 20-59 years (2003 - 2004)	1.50 (1.20-1.86)	1.40 (1.10-1.90)	3.40 (2.60-4.20)	6.20 (5.30-7.00)	9.50 (7.00-12.0)	1322
Age 20-59 years (2005 - 2006)	1.45 (1.11-1.89)	1.30 (.900-1.90)	3.10 (2.10-4.60)	6.40 (4.30-10.0)	11.0 (6.90-14.0)	1537
Age 20-59 years (2007 - 2008)	1.60 (1.28-2.01)	1.56 (1.13-2.04)	3.33 (2.61-4.43)	6.90 (4.94-9.29)	11.0 (7.39-15.6)	1607
Age 20-59 years (2009 - 2010)	1.67 (1.24-2.26)	1.53 (.893-2.56)	4.07 (2.66-5.85)	8.47 (6.66-10.2)	13.0 (10.1-16.2)	1797
Age 60+ years (2005 - 2006)	1.43 (.996-2.05)	1.40 (.850-2.00)	3.20 (1.60-5.90)	6.50 (3.20-15.0)	9.70 (5.00-18.0)	670
Age 60+ years (2007 - 2008)	1.28 (1.07-1.53)	1.20 (.870-1.59)	2.60 (1.90-3.41)	4.88 (3.67-6.50)	7.39 (5.70-8.80)	893
Age 60+ years (2009 - 2010)	1.41 (1.13-1.78)	1.33 (.851-1.86)	3.25 (2.39-4.25)	6.07 (5.07-7.59)	8.42 (6.95-11.6)	920
Males (2001 - 2002)	2.19 (1.60-3.00)	2.31 (1.63-3.21)	4.64 (3.21-6.08)	7.96 (5.74-15.3)	13.0 (6.93-20.5)	382
Males (2003 - 2004)	1.48 (1.18-1.85)	1.40 (.940-2.00)	3.40 (2.60-4.30)	6.60 (5.40-7.20)	11.0 (7.20-14.0)	650
Males (2005 - 2006)	1.39 (1.07-1.80)	1.20 (.830-1.70)	3.00 (2.00-4.30)	6.50 (4.30-10.0)	11.0 (6.80-16.0)	1489
Males (2007 - 2008)	1.52 (1.24-1.87)	1.50 (1.03-1.95)	3.23 (2.59-4.20)	6.72 (4.80-9.02)	11.0 (7.31-15.9)	1487
Males (2009 - 2010)	1.58 (1.21-2.05)	1.41 (.861-2.23)	3.79 (2.46-5.62)	8.32 (6.36-10.6)	13.0 (10.1-17.2)	1616
Females (2001 - 2002)	2.24 (1.66-3.01)	2.28 (1.49-3.24)	4.63 (3.09-7.01)	8.62 (5.26-12.9)	11.1 (7.68-25.0)	403
Females (2003 - 2004)	1.51 (1.21-1.90)	1.50 (1.10-1.90)	3.30 (2.50-4.20)	6.10 (4.69-7.30)	7.80 (6.40-12.0)	672
Females (2005 - 2006)	1.44 (1.10-1.88)	1.30 (.900-1.90)	3.10 (2.10-4.60)	6.20 (4.20-9.40)	9.40 (6.30-13.0)	1650
Females (2007 - 2008)	1.51 (1.22-1.87)	1.40 (1.01-1.92)	3.03 (2.42-4.10)	6.20 (4.60-7.82)	8.31 (6.80-12.9)	1495
Females (2009 - 2010)	1.64 (1.24-2.16)	1.53 (.946-2.46)	3.92 (2.79-5.19)	7.67 (6.22-9.28)	11.2 (8.99-13.9)	1659
Mexican Americans (2001 - 2002)	3.28 (2.29-4.68)	3.32 (2.19-4.70)	6.81 (3.71-10.4)	10.8 (8.24-14.7)	14.7 (11.1-20.5)	227
Mexican Americans (2003 - 2004)	1.65 (1.15-2.38)	1.60 (.820-2.80)	3.50 (2.60-4.90)	7.30 (4.50-10.0)	10.0 (7.30-11.0)	244
Mexican Americans (2005 - 2006)	1.95 (1.19-3.18)	1.90 (1.00-3.70)	4.40 (2.10-9.10)	9.10 (4.80-17.0)	14.0 (7.50-22.0)	771
Mexican Americans (2007 - 2008)	1.61 (1.27-2.03)	1.57 (1.08-2.20)	3.44 (2.42-4.50)	5.93 (4.70-8.15)	8.90 (6.80-13.2)	574
Mexican Americans (2009 - 2010)	2.19 (1.37-3.49)	2.18 (1.10-4.16)	5.50 (3.20-8.98)	11.3 (6.59-19.5)	16.2 (11.2-22.5)	667
Non-Hispanic blacks (2001 - 2002)	2.32 (1.82-2.94)	2.50 (1.56-3.55)	4.57 (3.60-5.56)	8.69 (5.63-9.49)	10.0 (5.89-13.5)	130
Non-Hispanic blacks (2003 - 2004)	1.56 (1.15-2.13)	1.70 (1.10-2.20)	2.90 (2.15-3.80)	5.10 (3.80-6.60)	6.60 (4.90-13.0)	290
Non-Hispanic blacks (2005 - 2006)	1.74 (1.27-2.37)	1.70 (1.00-2.70)	3.80 (2.70-4.80)	6.40 (4.50-8.90)	8.70 (6.60-11.0)	817
Non-Hispanic blacks (2007 - 2008)	1.72 (1.42-2.08)	1.70 (1.30-2.21)	3.29 (2.80-4.01)	5.78 (4.70-7.30)	7.49 (6.03-9.70)	593
Non-Hispanic blacks (2009 - 2010)	1.97 (1.50-2.58)	1.99 (1.41-2.53)	3.76 (2.55-5.82)	7.70 (5.35-10.2)	10.5 (8.52-13.4)	579
Non-Hispanic whites (2001 - 2002)	2.02 (1.42-2.87)	2.16 (1.36-3.09)	4.34 (2.92-6.01)	7.33 (4.72-15.3)	11.1 (6.01-26.1)	365
Non-Hispanic whites (2003 - 2004)	1.42 (1.11-1.81)	1.30 (.850-1.90)	3.30 (2.30-4.40)	6.20 (5.20-7.20)	9.80 (6.70-13.0)	684
Non-Hispanic whites (2005 - 2006)	1.29 (.989-1.67)	1.10 (.710-1.70)	2.70 (1.80-4.10)	5.80 (4.00-8.60)	9.40 (6.20-14.0)	1318
Non-Hispanic whites (2007 - 2008)	1.45 (1.11-1.87)	1.32 (.917-1.90)	3.03 (2.23-4.30)	6.50 (4.20-9.29)	9.59 (6.30-15.3)	1347
Non-Hispanic whites (2009 - 2010)	1.46 (1.06-2.02)	1.25 (.673-2.30)	3.59 (2.22-5.37)	7.28 (5.51-9.28)	10.9 (8.50-14.3)	1470

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.233, 0.62, 0.62, 0.62, and 0.62, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Blood Bromodichloromethane (2011 – 2016)

CAS Number 75-27-4

Geometric mean and selected percentiles of concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.34 (1.07-1.67)	1.18 (.817-1.66)	2.94 (2.07-3.92)	5.89 (4.32-8.29)	8.95 (6.35-13.5)	2700
Total population (2013 - 2014)	*	< LOD	< LOD	7.00 (<LOD-8.00)	10.0 (8.00-11.0)	3160
Total population (2015 - 2016)	*	< LOD	< LOD	9.00 (6.00-13.0)	13.0 (9.00-21.0)	3077
Age 12-19 years (2011 - 2012)	*	.956 (<LOD-1.21)	2.03 (1.51-3.00)	4.19 (3.06-6.62)	7.32 (4.56-12.1)	507
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	9.00 (6.00-10.0)	594
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	6.00 (<LOD-10.0)	9.00 (<LOD-15.0)	543
Age 20+ years (2011 - 2012)	1.38 (1.09-1.75)	1.22 (.826-1.82)	3.00 (2.19-4.14)	6.00 (4.35-8.62)	9.06 (6.49-13.7)	2193
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	7.00 (<LOD-9.00)	10.0 (8.00-12.0)	2566
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	9.00 (6.00-14.0)	14.0 (9.00-21.0)	2534
Males (2011 - 2012)	1.33 (1.06-1.67)	1.17 (.756-1.69)	2.91 (2.08-3.88)	5.92 (4.48-8.29)	9.17 (6.65-13.3)	1363
Males (2013 - 2014)	*	< LOD	< LOD	7.00 (<LOD-9.00)	10.0 (8.00-13.0)	1523
Males (2015 - 2016)	*	< LOD	< LOD	9.00 (6.00-14.0)	15.0 (10.0-19.0)	1523
Females (2011 - 2012)	1.35 (1.07-1.70)	1.22 (.828-1.70)	2.94 (1.96-4.06)	5.87 (4.05-8.63)	8.63 (5.87-13.3)	1337
Females (2013 - 2014)	*	< LOD	< LOD	6.00 (<LOD-8.00)	9.00 (7.00-11.0)	1637
Females (2015 - 2016)	*	< LOD	< LOD	8.00 (<LOD-13.0)	13.0 (7.00-21.0)	1554
Mexican Americans (2011 - 2012)	1.53 (1.16-2.04)	1.19 (.761-2.16)	3.44 (2.41-5.20)	9.06 (5.21-15.4)	15.9 (6.55-40.0)	298
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	10.0 (<LOD-14.0)	500
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	9.00 (7.00-12.0)	13.0 (9.00-17.0)	552
Non-Hispanic blacks (2011 - 2012)	1.84 (1.09-3.12)	1.72 (.734-3.80)	4.48 (2.11-8.95)	9.60 (5.03-15.2)	13.0 (8.47-22.3)	712
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	7.00 (<LOD-10.0)	9.00 (8.00-11.0)	603
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	7.00 (<LOD-13.0)	11.0 (6.00-18.0)	639
Non-Hispanic whites (2011 - 2012)	1.18 (.909-1.53)	1.03 (<LOD-1.51)	2.55 (1.65-3.42)	4.83 (3.26-6.95)	7.54 (4.79-12.6)	933
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	7.00 (<LOD-8.00)	9.00 (8.00-11.0)	1288
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	9.00 (<LOD-15.0)	14.0 (8.00-21.0)	999
All Hispanics (2011 - 2012)	1.70 (1.39-2.08)	1.52 (1.11-2.16)	3.66 (2.86-4.69)	8.08 (5.98-9.67)	12.9 (7.51-22.1)	587
All Hispanics (2013 - 2014)	*	< LOD	< LOD	7.00 (<LOD-10.0)	11.0 (8.00-14.0)	798
All Hispanics (2015 - 2016)	*	< LOD	< LOD	9.00 (7.00-12.0)	13.0 (9.00-17.0)	964
Asians (2011 - 2012)	1.49 (1.20-1.84)	1.43 (.998-1.96)	3.04 (2.39-4.11)	5.23 (4.63-6.51)	7.44 (5.99-9.64)	388
Asians (2013 - 2014)	*	< LOD	< LOD	9.00 (<LOD-12.0)	12.0 (9.00-15.0)	361
Asians (2015 - 2016)	*	< LOD	< LOD	9.00 (6.00-13.0)	14.0 (12.0-15.0)	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.620, 6.00, and 6.00 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Blood Dibromochloromethane (Chlorodibromomethane) (2001 – 2010)

CAS Number 124-48-1

Geometric mean and selected percentiles of whole blood concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	.867 (.521-1.44)	.780 (.340-1.90)	2.61 (1.22-4.38)	5.46 (3.53-9.71)	8.96 (5.04-12.9)	781
Total population (2003 - 2004)	*	< LOD	1.30 (1.00-1.80)	3.60 (2.70-4.80)	7.20 (4.80-8.60)	1333
Total population (2005 - 2006)	*	< LOD	1.40 (.870-2.40)	4.30 (2.40-7.40)	7.80 (4.60-13.0)	3122
Total population (2007 - 2008)	*	.775 (<LOD-1.05)	1.90 (1.36-2.73)	4.29 (3.20-6.13)	7.14 (5.54-9.52)	2998
Total population (2009 - 2010)	*	.799 (<LOD-1.26)	2.14 (1.57-2.99)	4.50 (3.38-6.90)	8.47 (5.20-11.6)	3163
Age 12-19 years (2005 - 2006)	*	< LOD	1.30 (.750-2.50)	4.10 (2.60-5.50)	6.50 (4.10-11.0)	925
Age 12-19 years (2007 - 2008)	*	.760 (<LOD-1.06)	2.09 (1.30-3.05)	4.50 (3.09-7.22)	8.32 (5.39-14.4)	484
Age 12-19 years (2009 - 2010)	*	.786 (<LOD-1.33)	2.23 (1.37-3.33)	4.63 (3.83-7.81)	9.52 (5.81-12.4)	548
Age 20-59 years (2001 - 2002)	.867 (.521-1.44)	.780 (.340-1.90)	2.61 (1.22-4.38)	5.46 (3.53-9.71)	8.96 (5.04-12.9)	781
Age 20-59 years (2003 - 2004)	*	< LOD	1.30 (1.00-1.80)	3.60 (2.70-4.80)	7.20 (4.80-8.60)	1333
Age 20-59 years (2005 - 2006)	*	< LOD	1.40 (.860-2.30)	4.10 (2.40-7.10)	7.80 (4.20-14.0)	1526
Age 20-59 years (2007 - 2008)	*	.846 (<LOD-1.15)	2.07 (1.50-2.92)	4.75 (3.40-6.60)	7.99 (5.80-10.5)	1617
Age 20-59 years (2009 - 2010)	*	.827 (<LOD-1.33)	2.21 (1.63-3.04)	4.53 (3.35-7.58)	8.81 (5.09-13.0)	1747
Age 60+ years (2005 - 2006)	*	< LOD	1.60 (.780-4.00)	5.10 (1.30-13.0)	7.90 (2.20-20.0)	671
Age 60+ years (2007 - 2008)	*	.630 (<LOD-.874)	1.40 (.918-2.28)	3.40 (2.16-4.63)	4.86 (3.79-5.50)	897
Age 60+ years (2009 - 2010)	*	.669 (<LOD-1.12)	1.92 (1.27-2.94)	4.18 (2.99-5.98)	7.52 (4.18-12.1)	868
Males (2001 - 2002)	.850 (.481-1.50)	.730 (.300-2.25)	2.66 (.960-4.38)	4.77 (3.33-9.20)	8.06 (4.31-14.6)	371
Males (2003 - 2004)	*	< LOD	1.30 (1.00-1.90)	3.70 (2.70-5.70)	7.20 (5.20-8.60)	657
Males (2005 - 2006)	*	< LOD	1.40 (.830-2.30)	4.40 (2.30-7.80)	8.30 (4.30-14.0)	1487
Males (2007 - 2008)	*	.762 (<LOD-1.10)	2.10 (1.38-2.87)	4.30 (3.30-6.50)	7.50 (5.66-10.5)	1496
Males (2009 - 2010)	*	.734 (<LOD-1.23)	2.22 (1.62-3.11)	4.85 (3.52-7.70)	8.79 (5.19-13.4)	1563
Females (2001 - 2002)	.884 (.550-1.42)	.820 (.340-1.69)	2.54 (1.37-4.31)	6.30 (3.28-10.1)	9.91 (5.02-13.0)	410
Females (2003 - 2004)	*	< LOD	1.30 (1.00-1.80)	3.60 (2.50-4.80)	6.60 (3.80-9.20)	676
Females (2005 - 2006)	*	< LOD	1.50 (.920-2.50)	4.20 (2.20-7.80)	7.20 (4.10-14.0)	1635
Females (2007 - 2008)	*	.776 (<LOD-1.04)	1.80 (1.34-2.62)	4.25 (2.88-6.07)	6.40 (4.91-9.70)	1502
Females (2009 - 2010)	*	.863 (<LOD-1.29)	2.09 (1.52-2.89)	4.14 (3.17-6.58)	7.95 (4.75-11.3)	1600

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.271, 0.62, 0.62, 0.62, and 0.62, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Blood Dibromochloromethane (Chlorodibromomethane) (2001 – 2010)

CAS Number 124-48-1

Geometric mean and selected percentiles of whole blood concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Males (2001 - 2002)	.850 (.481-1.50)	.730 (.300-2.25)	2.66 (.960-4.38)	4.77 (3.33-9.20)	8.06 (4.31-14.6)	371
Males (2003 - 2004)	*	< LOD	1.30 (1.00-1.90)	3.70 (2.70-5.70)	7.20 (5.20-8.60)	657
Males (2005 - 2006)	*	< LOD	1.40 (.830-2.30)	4.40 (2.30-7.80)	8.30 (4.30-14.0)	1487
Males (2007 - 2008)	*	.762 (<LOD-1.10)	2.10 (1.38-2.87)	4.30 (3.30-6.50)	7.50 (5.66-10.5)	1496
Males (2009 - 2010)	*	.734 (<LOD-1.23)	2.22 (1.62-3.11)	4.85 (3.52-7.70)	8.79 (5.19-13.4)	1563
Females (2001 - 2002)	.884 (.550-1.42)	.820 (.340-1.69)	2.54 (1.37-4.31)	6.30 (3.28-10.1)	9.91 (5.02-13.0)	410
Females (2003 - 2004)	*	< LOD	1.30 (1.00-1.80)	3.60 (2.50-4.80)	6.60 (3.80-9.20)	676
Females (2005 - 2006)	*	< LOD	1.50 (.920-2.50)	4.20 (2.20-7.80)	7.20 (4.10-14.0)	1635
Females (2007 - 2008)	*	.776 (<LOD-1.04)	1.80 (1.34-2.62)	4.25 (2.88-6.07)	6.40 (4.91-9.70)	1502
Females (2009 - 2010)	*	.863 (<LOD-1.29)	2.09 (1.52-2.89)	4.14 (3.17-6.58)	7.95 (4.75-11.3)	1600
Mexican Americans (2001 - 2002)	1.61 (.843-3.06)	1.49 (.670-3.99)	4.59 (1.93-8.89)	9.26 (5.21-12.1)	12.0 (9.63-16.1)	233
Mexican Americans (2003 - 2004)	1.20 (.963-1.50)	1.10 (.810-1.40)	2.30 (1.50-4.10)	5.20 (3.80-6.90)	7.70 (5.20-11.0)	256
Mexican Americans (2005 - 2006)	1.25 (.774-2.02)	.950 (<LOD-1.70)	2.50 (1.00-7.40)	7.40 (2.50-19.0)	13.0 (5.80-21.0)	759
Mexican Americans (2007 - 2008)	1.54 (1.09-2.18)	1.38 (.864-2.10)	3.20 (1.79-5.80)	7.70 (3.35-13.0)	9.81 (7.10-18.2)	574
Mexican Americans (2009 - 2010)	1.80 (1.17-2.76)	1.62 (.788-3.51)	4.71 (2.61-8.06)	9.21 (6.90-12.5)	13.7 (10.0-18.8)	632
Non-Hispanic blacks (2001 - 2002)	1.03 (.505-2.09)	.930 (.530-2.03)	2.03 (.770-7.06)	4.22 (2.01-10.5)	8.09 (2.80-16.5)	128
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.970 (.650-1.60)	1.90 (1.20-3.20)	3.20 (1.80-5.20)	288
Non-Hispanic blacks (2005 - 2006)	*	.620 (<LOD-.820)	1.30 (1.00-1.90)	3.40 (2.10-4.90)	5.50 (4.10-7.10)	822
Non-Hispanic blacks (2007 - 2008)	.979 (.752-1.27)	.811 (<LOD-1.12)	1.60 (1.02-2.70)	3.28 (2.18-5.67)	5.67 (3.05-8.50)	593
Non-Hispanic blacks (2009 - 2010)	*	.724 (<LOD-1.21)	1.62 (1.19-2.10)	3.21 (2.44-4.08)	5.04 (3.76-8.42)	556
Non-Hispanic whites (2001 - 2002)	.736 (.413-1.31)	.640 (<LOD-1.93)	2.49 (.870-4.27)	4.57 (3.00-7.12)	6.98 (4.27-11.1)	357
Non-Hispanic whites (2003 - 2004)	*	< LOD	1.30 (.950-1.80)	3.30 (2.50-4.60)	6.60 (3.70-9.20)	685
Non-Hispanic whites (2005 - 2006)	*	< LOD	1.30 (.710-2.30)	4.10 (2.30-7.10)	7.70 (4.60-11.0)	1311
Non-Hispanic whites (2007 - 2008)	*	.665 (<LOD-1.02)	1.79 (1.09-2.88)	3.95 (2.60-5.78)	6.03 (4.02-9.80)	1358
Non-Hispanic whites (2009 - 2010)	*	.696 (<LOD-1.22)	1.92 (1.28-2.72)	3.89 (2.96-5.48)	6.53 (4.16-10.7)	1424

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.271, 0.62, 0.62, 0.62, and 0.62, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Blood Dibromochloromethane (Chlorodibromomethane) (2011 – 2016)

CAS Number 124-48-1

Geometric mean and selected percentiles of concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	1.77 (1.31-2.09)	3.61 (2.73-4.87)	5.77 (3.93-9.82)	2639
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	7.00 (6.00-10.0)	3195
Total population (2015 - 2016)	*	< LOD	< LOD	6.00 (<LOD-14.0)	11.0 (5.00-24.0)	3087
Age 12-19 years (2011 - 2012)	*	< LOD	1.02 (.797-1.37)	2.15 (1.81-3.55)	4.00 (2.30-8.73)	486
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	598
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	5.00 (<LOD-11.0)	9.00 (<LOD-13.0)	546
Age 20+ years (2011 - 2012)	*	< LOD	1.84 (1.38-2.21)	3.81 (2.84-5.03)	5.93 (4.09-9.89)	2153
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	7.00 (6.00-10.0)	2597
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	7.00 (<LOD-15.0)	11.0 (5.00-25.0)	2541
Males (2011 - 2012)	*	< LOD	1.64 (1.14-2.07)	3.53 (2.51-4.72)	5.58 (3.79-8.69)	1336
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	7.00 (5.00-12.0)	1543
Males (2015 - 2016)	*	< LOD	< LOD	6.00 (<LOD-14.0)	11.0 (5.00-20.0)	1527
Females (2011 - 2012)	*	< LOD	1.88 (1.38-2.22)	3.66 (2.64-5.27)	5.99 (4.03-9.82)	1303
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	7.00 (5.00-9.00)	1652
Females (2015 - 2016)	*	< LOD	< LOD	7.00 (<LOD-15.0)	10.0 (5.00-27.0)	1560
Mexican Americans (2011 - 2012)	*	.921 (<LOD-1.10)	2.21 (1.88-2.99)	4.60 (2.61-19.9)	14.2 (4.05-28.8)	283
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	6.00 (<LOD-10.0)	10.0 (7.00-15.0)	505
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	8.00 (5.00-14.0)	12.0 (8.00-20.0)	557
Non-Hispanic blacks (2011 - 2012)	*	.678 (<LOD-1.35)	2.05 (.975-3.79)	4.53 (1.97-14.4)	8.70 (2.96-27.4)	695
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	7.00 (<LOD-14.0)	612
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	5.00 (<LOD-18.0)	10.0 (<LOD-25.0)	641
Non-Hispanic whites (2011 - 2012)	*	< LOD	1.69 (1.08-2.09)	3.27 (2.48-4.57)	5.22 (3.58-7.32)	924
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	6.00 (<LOD-8.00)	1301
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	6.00 (<LOD-16.0)	11.0 (5.00-28.0)	1000
All Hispanics (2011 - 2012)	*	.711 (<LOD-1.01)	2.10 (1.52-2.52)	4.10 (2.69-9.33)	9.96 (3.96-21.3)	570
All Hispanics (2013 - 2014)	*	< LOD	< LOD	6.00 (<LOD-9.00)	10.0 (7.00-14.0)	809
All Hispanics (2015 - 2016)	*	< LOD	< LOD	8.00 (5.00-12.0)	12.0 (7.00-20.0)	970
Asians (2011 - 2012)	*	< LOD	1.52 (.951-2.25)	3.49 (2.17-4.41)	4.55 (3.78-5.56)	372
Asians (2013 - 2014)	*	< LOD	< LOD	6.00 (<LOD-12.0)	10.0 (7.00-16.0)	363
Asians (2015 - 2016)	*	< LOD	< LOD	6.00 (<LOD-8.00)	9.00 (5.00-20.0)	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.620, 5.00, and 5.00 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Blood Tribromomethane (Bromoform) (2001 – 2010)

CAS Number 75-25-2

Geometric mean and selected percentiles of whole blood concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	1.57 (1.07-2.31)	1.39 (.960-2.02)	2.78 (1.76-4.63)	6.05 (2.92-29.2)	15.5 (3.68-85.4)	774
Total population (2003 - 2004)	*	< LOD	1.80 (<LOD-2.80)	3.74 (2.30-7.10)	6.40 (3.60-14.0)	1310
Total population (2005 - 2006)	*	< LOD	1.20 (<LOD-1.60)	2.70 (2.00-4.00)	5.20 (3.10-7.60)	3016
Total population (2007 - 2008)	*	< LOD	< LOD	2.51 (1.90-3.34)	5.20 (3.54-7.44)	2994
Total population (2009 - 2010)	*	< LOD	1.12 (<LOD-1.61)	2.55 (1.81-4.07)	4.76 (2.95-7.12)	3254
Age 12-19 years (2005 - 2006)	*	< LOD	1.20 (<LOD-1.60)	2.40 (1.70-4.40)	4.80 (2.80-7.10)	892
Age 12-19 years (2007 - 2008)	*	< LOD	1.11 (<LOD-1.29)	2.80 (1.90-4.77)	6.69 (3.50-7.88)	484
Age 12-19 years (2009 - 2010)	*	< LOD	1.14 (<LOD-1.61)	2.41 (1.71-4.15)	5.23 (2.72-13.1)	559
Age 20-59 years (2001 - 2002)	1.57 (1.07-2.31)	1.39 (.960-2.02)	2.78 (1.76-4.63)	6.05 (2.92-29.2)	15.5 (3.68-85.4)	774
Age 20-59 years (2003 - 2004)	*	< LOD	1.80 (<LOD-2.80)	3.74 (2.30-7.10)	6.40 (3.60-14.0)	1310
Age 20-59 years (2005 - 2006)	*	< LOD	1.20 (<LOD-1.60)	2.90 (1.90-4.20)	5.20 (3.10-8.80)	1478
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	2.73 (1.93-3.74)	6.48 (3.74-7.98)	1614
Age 20-59 years (2009 - 2010)	*	< LOD	1.12 (<LOD-1.63)	2.57 (1.81-4.34)	5.07 (2.94-7.35)	1793
Age 60+ years (2005 - 2006)	*	< LOD	1.28 (<LOD-2.10)	2.60 (2.30-3.50)	4.70 (3.00-7.70)	646
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	1.78 (1.33-2.72)	3.24 (2.16-4.91)	896
Age 60+ years (2009 - 2010)	*	< LOD	1.12 (<LOD-1.56)	2.49 (1.56-4.39)	4.26 (2.66-5.70)	902
Males (2001 - 2002)	1.49 (.944-2.34)	1.29 (.850-1.98)	2.65 (1.49-5.05)	6.12 (2.26-33.9)	14.9 (2.79-69.9)	374
Males (2003 - 2004)	*	< LOD	1.90 (<LOD-2.87)	4.00 (2.40-6.80)	6.50 (4.00-13.0)	645
Males (2005 - 2006)	*	< LOD	1.16 (<LOD-1.60)	2.70 (1.90-4.00)	5.00 (3.10-7.60)	1424
Males (2007 - 2008)	*	< LOD	< LOD	2.40 (1.71-3.51)	6.00 (3.23-8.49)	1494
Males (2009 - 2010)	*	< LOD	1.15 (<LOD-1.66)	2.78 (1.83-4.47)	5.60 (3.42-8.62)	1604
Females (2001 - 2002)	1.67 (1.17-2.39)	1.46 (1.05-2.21)	2.86 (1.89-4.57)	5.69 (3.30-27.5)	22.2 (5.09-49.6)	400
Females (2003 - 2004)	*	< LOD	1.72 (<LOD-2.65)	3.20 (1.93-7.70)	6.10 (3.10-31.0)	665
Females (2005 - 2006)	*	< LOD	1.23 (1.00-1.60)	2.70 (1.90-4.20)	5.20 (3.10-8.80)	1592
Females (2007 - 2008)	*	< LOD	< LOD	2.57 (1.90-3.40)	4.88 (3.55-7.30)	1500
Females (2009 - 2010)	*	< LOD	1.11 (<LOD-1.58)	2.38 (1.66-3.84)	4.40 (2.66-6.13)	1650

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.596, 1.5, 1.0, 1.0, and 1.0, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Blood Tribromomethane (Bromoform) (2001 – 2010)

CAS Number 75-25-2

Geometric mean and selected percentiles of whole blood concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	2.34 (1.15-4.77)	1.66 (.990-3.38)	4.03 (1.42-36.5)	28.3 (4.39-49.2)	40.8 (31.5-57.9)	234
Mexican Americans (2003 - 2004)	*	1.60 (<LOD-3.10)	3.30 (<LOD-9.40)	7.60 (3.60-14.0)	11.0 (5.60-21.0)	242
Mexican Americans (2005 - 2006)	*	< LOD	1.60 (1.04-3.20)	4.00 (2.40-5.90)	5.90 (4.30-8.30)	721
Mexican Americans (2007 - 2008)	*	< LOD	2.82 (1.23-6.70)	6.80 (2.93-11.0)	9.54 (6.10-15.7)	574
Mexican Americans (2009 - 2010)	*	< LOD	1.93 (1.43-2.35)	4.23 (2.57-6.17)	6.32 (3.79-12.3)	642
Non-Hispanic blacks (2001 - 2002)	1.51 (.857-2.67)	1.47 (.780-3.15)	2.58 (1.39-4.64)	4.34 (2.57-8.48)	6.27 (3.28-15.2)	121
Non-Hispanic blacks (2003 - 2004)	*	< LOD	1.60 (<LOD-2.30)	2.50 (1.80-3.20)	3.20 (2.40-6.10)	289
Non-Hispanic blacks (2005 - 2006)	*	< LOD	1.10 (<LOD-1.30)	2.00 (1.70-2.40)	3.40 (2.30-4.30)	796
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	1.54 (<LOD-3.54)	3.07 (1.47-7.20)	592
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	1.45 (<LOD-2.28)	2.74 (1.40-6.04)	581
Non-Hispanic whites (2001 - 2002)	1.47 (.980-2.22)	1.29 (.840-2.06)	2.58 (1.51-4.91)	5.69 (2.84-21.2)	11.0 (3.30-69.9)	362
Non-Hispanic whites (2003 - 2004)	*	< LOD	1.70 (<LOD-2.90)	3.50 (2.00-7.70)	5.90 (3.30-21.0)	680
Non-Hispanic whites (2005 - 2006)	*	< LOD	1.20 (<LOD-1.60)	2.80 (2.00-3.90)	5.40 (3.10-9.90)	1271
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	1.90 (1.33-2.97)	3.51 (1.93-7.81)	1355
Non-Hispanic whites (2009 - 2010)	*	< LOD	1.02 (<LOD-1.50)	2.15 (1.64-3.59)	4.07 (2.46-6.17)	1474

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.596, 1.5, 1.0, 1.0, and 1.0, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Blood Tribromomethane (Bromoform) (2011 – 2016)

CAS Number 75-25-2

Geometric mean and selected percentiles of concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	1.88 (1.45-2.67)	3.43 (2.32-6.17)	2695
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	8.00 (<LOD-10.0)	3158
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-16.0)	3046
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	1.72 (1.19-2.68)	2.92 (2.26-5.22)	506
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	592
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-25.0)	540
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	1.94 (1.42-2.79)	3.81 (2.29-6.54)	2189
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	8.00 (<LOD-10.0)	2566
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-15.0)	2506
Males (2011 - 2012)	*	< LOD	< LOD	1.72 (1.35-2.18)	2.87 (1.88-5.10)	1367
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1525
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-15.0)	1506
Females (2011 - 2012)	*	< LOD	< LOD	2.26 (1.43-3.83)	4.47 (2.47-6.80)	1328
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	9.00 (<LOD-12.0)	1633
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-16.0)	1540
Mexican Americans (2011 - 2012)	*	< LOD	1.51 (<LOD-3.16)	3.68 (1.64-7.50)	6.42 (3.15-13.4)	295
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	11.0 (<LOD-17.0)	503
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	9.00 (<LOD-27.0)	13.0 (8.00-28.0)	553
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	1.58 (<LOD-3.24)	3.05 (1.49-5.21)	704
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	599
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-19.0)	628
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	1.85 (1.46-2.47)	3.02 (2.39-5.69)	941
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1282
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-18.0)	986
All Hispanics (2011 - 2012)	*	< LOD	1.02 (<LOD-1.74)	2.54 (1.23-5.61)	4.63 (2.26-8.96)	583
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	11.0 (<LOD-14.0)	806
All Hispanics (2015 - 2016)	*	< LOD	< LOD	8.00 (<LOD-20.0)	11.0 (<LOD-28.0)	963
Asians (2011 - 2012)	*	< LOD	< LOD	1.48 (<LOD-2.38)	2.39 (1.42-4.98)	386
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	11.0 (<LOD-12.0)	362
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	8.00 (<LOD-14.0)	344

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 1.00, 8.00, and 8.00 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Blood Trichloromethane (Chloroform) (2001 – 2010)

CAS Number 67-66-3

Geometric mean and selected percentiles of whole blood concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	16.6 (13.0-21.1)	16.1 (11.9-22.2)	31.7 (23.9-40.4)	55.5 (44.5-68.6)	72.1 (57.3-105)	744
Total population (2003 - 2004)	10.2 (8.56-12.2)	10.0 (8.50-13.0)	20.0 (17.0-24.0)	35.0 (29.0-40.0)	50.0 (37.0-65.0)	1222
Total population (2005 - 2006)	10.1 (9.09-11.3)	9.90 (8.90-11.0)	19.0 (17.0-21.0)	36.0 (31.0-41.0)	54.0 (46.0-64.0)	3111
Total population (2007 - 2008)	6.63 (5.30-8.30)	6.56 (4.87-8.83)	14.6 (11.0-19.4)	27.7 (22.0-37.0)	41.8 (33.0-54.1)	2754
Total population (2009 - 2010)	8.60 (6.82-10.8)	8.29 (5.94-11.1)	17.1 (12.8-23.0)	32.1 (26.1-41.9)	47.2 (39.9-57.6)	3269
Age 12-19 years (2005 - 2006)	9.22 (8.20-10.4)	9.10 (8.10-10.0)	17.0 (14.0-20.0)	33.0 (27.0-40.0)	46.0 (36.0-64.0)	913
Age 12-19 years (2007 - 2008)	5.95 (4.69-7.53)	5.33 (3.92-7.98)	12.5 (8.56-19.0)	25.5 (17.6-48.3)	47.6 (26.0-56.8)	440
Age 12-19 years (2009 - 2010)	8.60 (6.78-10.9)	8.05 (5.96-10.7)	17.7 (13.4-23.1)	33.9 (28.5-44.8)	46.7 (35.4-68.1)	561
Age 20-59 years (2001 - 2002)	16.6 (13.0-21.1)	16.1 (11.9-22.2)	31.7 (23.9-40.4)	55.5 (44.5-68.6)	72.1 (57.3-105)	744
Age 20-59 years (2003 - 2004)	10.2 (8.56-12.2)	10.0 (8.50-13.0)	20.0 (17.0-24.0)	35.0 (29.0-40.0)	50.0 (37.0-65.0)	1222
Age 20-59 years (2005 - 2006)	10.5 (9.29-11.8)	10.0 (8.90-12.0)	20.0 (18.0-22.0)	37.0 (31.0-44.0)	55.0 (46.0-71.0)	1529
Age 20-59 years (2007 - 2008)	6.89 (5.37-8.83)	6.78 (5.00-9.53)	15.1 (11.2-20.8)	29.0 (23.3-38.3)	42.0 (34.2-55.8)	1503
Age 20-59 years (2009 - 2010)	8.82 (6.77-11.5)	8.67 (5.88-12.3)	17.7 (13.1-23.7)	33.8 (26.0-44.5)	49.6 (40.5-64.6)	1792
Age 60+ years (2005 - 2006)	9.71 (8.25-11.4)	9.60 (8.20-11.0)	19.0 (14.0-22.0)	35.0 (27.0-40.0)	46.0 (39.0-59.0)	669
Age 60+ years (2007 - 2008)	6.25 (5.24-7.46)	6.34 (4.64-8.30)	14.0 (11.0-17.2)	24.8 (19.5-33.0)	36.0 (25.4-48.6)	811
Age 60+ years (2009 - 2010)	7.98 (6.53-9.76)	7.60 (5.79-10.1)	15.1 (11.6-19.5)	27.8 (20.5-32.9)	39.9 (30.4-49.3)	916
Males (2001 - 2002)	16.8 (12.0-23.5)	16.1 (11.0-24.8)	34.3 (22.4-48.7)	57.0 (39.9-76.4)	75.2 (54.5-156)	358
Males (2003 - 2004)	10.1 (8.43-12.1)	10.0 (7.90-14.0)	20.0 (17.0-25.0)	36.8 (29.0-49.0)	53.0 (36.8-69.0)	599
Males (2005 - 2006)	9.94 (8.80-11.2)	9.80 (8.50-11.0)	19.0 (17.0-22.0)	38.0 (33.0-44.0)	54.0 (46.0-67.0)	1483
Males (2007 - 2008)	6.54 (5.25-8.14)	6.32 (4.85-8.43)	14.2 (11.0-19.1)	29.0 (21.9-37.6)	41.8 (31.8-59.2)	1376
Males (2009 - 2010)	8.38 (6.67-10.5)	8.13 (5.90-10.6)	17.0 (12.1-22.0)	32.0 (25.8-42.6)	50.7 (42.6-66.3)	1611
Females (2001 - 2002)	16.4 (13.4-20.1)	16.6 (12.0-21.5)	29.2 (24.0-36.5)	53.5 (38.4-68.9)	69.5 (53.3-104)	386
Females (2003 - 2004)	10.4 (8.41-12.7)	10.0 (8.40-13.0)	20.0 (16.0-23.9)	33.0 (26.0-40.0)	46.0 (35.0-65.0)	623
Females (2005 - 2006)	10.4 (9.24-11.6)	10.0 (9.10-11.0)	19.0 (17.0-21.0)	32.0 (29.0-39.0)	52.0 (41.0-67.0)	1628
Females (2007 - 2008)	6.73 (5.29-8.55)	6.73 (4.80-9.35)	15.0 (11.0-19.7)	26.9 (21.5-37.7)	42.0 (31.4-54.0)	1378
Females (2009 - 2010)	8.81 (6.94-11.2)	8.66 (5.92-12.0)	17.3 (13.0-24.0)	32.1 (24.8-42.1)	46.2 (34.0-59.9)	1658
Mexican Americans (2001 - 2002)	17.0 (10.5-27.6)	14.5 (10.0-32.7)	35.1 (18.6-57.6)	60.7 (41.5-100)	93.0 (49.7-243)	223
Mexican Americans (2003 - 2004)	9.17 (7.45-11.3)	9.30 (7.60-11.0)	19.0 (15.0-24.0)	34.0 (24.0-44.4)	44.4 (30.0-59.0)	225
Mexican Americans (2005 - 2006)	10.3 (8.59-12.5)	10.0 (7.60-14.0)	20.0 (17.0-22.0)	36.0 (30.0-41.0)	47.0 (41.0-64.0)	740
Mexican Americans (2007 - 2008)	5.87 (4.20-8.19)	5.23 (3.50-7.80)	13.0 (7.76-20.0)	30.3 (15.8-49.2)	45.9 (23.4-89.7)	504
Mexican Americans (2009 - 2010)	8.76 (6.82-11.3)	8.21 (6.02-11.6)	17.1 (12.0-22.0)	29.1 (21.9-44.7)	50.9 (33.6-70.9)	666
Non-Hispanic blacks (2001 - 2002)	19.1 (12.9-28.1)	20.9 (9.28-37.4)	38.4 (27.7-46.0)	55.9 (45.5-69.8)	68.9 (51.9-74.0)	116
Non-Hispanic blacks (2003 - 2004)	11.8 (9.54-14.6)	12.0 (8.90-15.0)	20.0 (15.0-30.0)	35.0 (28.0-59.0)	61.0 (34.0-100)	272
Non-Hispanic blacks (2005 - 2006)	11.9 (9.78-14.4)	12.0 (9.10-15.0)	22.0 (19.0-26.0)	39.0 (31.0-47.0)	55.0 (46.0-70.0)	822
Non-Hispanic blacks (2007 - 2008)	8.00 (6.22-10.3)	8.60 (6.20-11.0)	15.7 (12.0-20.0)	28.0 (22.3-37.0)	39.6 (34.5-46.6)	585
Non-Hispanic blacks (2009 - 2010)	12.6 (9.41-16.9)	12.5 (9.03-18.8)	24.7 (18.4-31.5)	42.9 (32.0-52.7)	57.0 (45.0-71.9)	581
Non-Hispanic whites (2001 - 2002)	15.6 (12.0-20.2)	15.2 (11.2-20.5)	26.8 (20.4-39.5)	53.5 (35.3-72.1)	69.5 (53.5-105)	348
Non-Hispanic whites (2003 - 2004)	9.84 (8.09-12.0)	10.0 (8.10-13.0)	20.0 (16.0-23.0)	33.8 (27.0-40.0)	47.0 (35.0-67.0)	630
Non-Hispanic whites (2005 - 2006)	9.87 (8.79-11.1)	9.70 (8.80-11.0)	19.0 (16.0-21.0)	34.0 (29.0-43.0)	53.0 (45.0-67.0)	1318
Non-Hispanic whites (2007 - 2008)	6.45 (4.95-8.40)	6.30 (4.16-9.23)	14.9 (10.1-21.0)	27.7 (21.0-40.0)	41.8 (31.0-58.9)	1226
Non-Hispanic whites (2009 - 2010)	7.89 (5.99-10.4)	7.17 (5.14-10.7)	15.7 (10.8-23.4)	30.0 (23.5-41.4)	44.6 (32.9-59.1)	1467

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 2.37, 2.11, 2.1, 2.1, and 2.1, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Blood Trichloromethane (Chloroform) (2011 – 2016)

CAS Number 67-66-3

Geometric mean and selected percentiles of concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	6.32 (5.24-7.62)	6.06 (4.73-8.00)	12.6 (10.1-16.2)	22.5 (19.8-27.0)	33.5 (27.7-40.2)	2589
Total population (2013 - 2014)	*	8.00 (<LOD-10.0)	16.0 (14.0-19.0)	27.0 (24.0-32.0)	40.0 (33.0-50.0)	3136
Total population (2015 - 2016)	*	9.00 (8.00-11.0)	17.0 (15.0-20.0)	30.0 (28.0-33.0)	47.0 (42.0-54.0)	2989
Age 12-19 years (2011 - 2012)	5.08 (4.10-6.29)	4.76 (3.42-6.21)	9.22 (7.76-12.4)	20.8 (15.5-25.8)	28.7 (21.5-34.6)	487
Age 12-19 years (2013 - 2014)	*	< LOD	14.0 (12.0-18.0)	28.0 (21.0-33.0)	35.0 (28.0-53.0)	588
Age 12-19 years (2015 - 2016)	*	< LOD	14.0 (11.0-17.0)	26.0 (19.0-35.0)	37.0 (26.0-53.0)	537
Age 20+ years (2011 - 2012)	6.54 (5.41-7.89)	6.26 (4.91-8.40)	12.9 (10.5-16.7)	23.2 (19.9-27.3)	34.1 (28.0-43.1)	2102
Age 20+ years (2013 - 2014)	*	8.00 (<LOD-10.0)	16.0 (14.0-19.0)	27.0 (25.0-32.0)	41.0 (34.0-50.0)	2548
Age 20+ years (2015 - 2016)	*	9.00 (8.00-11.0)	17.0 (16.0-20.0)	30.0 (28.0-35.0)	47.0 (40.0-57.0)	2452
Males (2011 - 2012)	6.27 (5.14-7.64)	6.18 (4.74-7.98)	12.3 (10.1-15.1)	22.3 (18.5-28.1)	35.6 (27.3-47.2)	1307
Males (2013 - 2014)	*	< LOD	16.0 (14.0-19.0)	26.0 (22.0-35.0)	38.0 (31.0-51.0)	1512
Males (2015 - 2016)	*	9.00 (<LOD-11.0)	17.0 (16.0-19.0)	31.0 (27.0-37.0)	51.0 (43.0-58.0)	1485
Females (2011 - 2012)	6.38 (5.25-7.75)	5.85 (4.62-8.16)	12.9 (9.94-17.9)	22.9 (19.4-28.0)	32.1 (26.6-41.0)	1282
Females (2013 - 2014)	*	9.00 (<LOD-10.0)	16.0 (14.0-19.0)	28.0 (25.0-34.0)	41.0 (33.0-52.0)	1624
Females (2015 - 2016)	*	9.00 (8.00-10.0)	17.0 (15.0-20.0)	29.0 (26.0-33.0)	42.0 (35.0-55.0)	1504
Mexican Americans (2011 - 2012)	6.14 (4.94-7.62)	5.91 (4.76-7.80)	11.7 (9.94-15.0)	23.1 (15.0-33.1)	32.5 (24.9-46.4)	269
Mexican Americans (2013 - 2014)	*	< LOD	9.00 (<LOD-14.0)	16.0 (12.0-22.0)	22.0 (16.0-33.0)	503
Mexican Americans (2015 - 2016)	*	8.00 (<LOD-10.0)	16.0 (12.0-21.0)	28.0 (23.0-35.0)	41.0 (32.0-46.0)	542
Non-Hispanic blacks (2011 - 2012)	8.64 (6.08-12.3)	8.28 (5.22-13.6)	17.0 (10.8-27.0)	30.8 (20.0-45.2)	42.6 (32.3-56.5)	697
Non-Hispanic blacks (2013 - 2014)	*	10.0 (<LOD-14.0)	18.0 (14.0-24.0)	30.0 (23.0-40.0)	40.0 (30.0-65.0)	595
Non-Hispanic blacks (2015 - 2016)	11.6 (10.2-13.2)	10.0 (9.00-13.0)	18.0 (15.0-21.0)	28.0 (23.0-34.0)	38.0 (33.0-46.0)	619
Non-Hispanic whites (2011 - 2012)	5.58 (4.50-6.90)	5.35 (3.85-7.41)	11.2 (7.93-14.6)	21.1 (16.7-25.4)	28.0 (24.0-37.0)	901
Non-Hispanic whites (2013 - 2014)	*	9.00 (<LOD-11.0)	17.0 (14.0-20.0)	28.0 (23.0-36.0)	41.0 (32.0-57.0)	1266
Non-Hispanic whites (2015 - 2016)	*	9.00 (<LOD-11.0)	17.0 (15.0-19.0)	30.0 (27.0-33.0)	49.0 (37.0-58.0)	989
All Hispanics (2011 - 2012)	7.85 (6.08-10.1)	8.03 (5.44-10.9)	15.3 (10.6-22.3)	26.3 (21.2-35.6)	37.2 (31.6-47.0)	546
All Hispanics (2013 - 2014)	*	< LOD	12.0 (<LOD-17.0)	23.0 (17.0-29.0)	30.0 (23.0-45.0)	806
All Hispanics (2015 - 2016)	*	9.00 (<LOD-11.0)	18.0 (14.0-22.0)	32.0 (27.0-36.0)	46.0 (36.0-52.0)	909
Asians (2011 - 2012)	7.71 (6.25-9.51)	7.99 (6.25-10.0)	14.2 (11.1-18.1)	22.9 (18.8-30.2)	31.3 (24.2-43.1)	371
Asians (2013 - 2014)	*	< LOD	14.0 (10.0-20.0)	25.0 (17.0-39.0)	39.0 (27.0-47.0)	361
Asians (2015 - 2016)	*	9.00 (<LOD-11.0)	16.0 (11.0-23.0)	32.0 (22.0-46.0)	47.0 (34.0-62.0)	346

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 2.10, 8.00, and 8.00 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/THM-DBP_BiomonitoringSummary.html

Urinary Benzophenone-3 (2003 – 2010)

CAS Number 131-57-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	22.9 (18.1-28.9)	18.1 (15.5-23.2)	94.0 (67.5-123)	370 (225-570)	1040 (698-1390)	2517
Total population (2005 - 2006)	19.4 (16.5-22.8)	14.1 (12.5-17.5)	68.8 (54.5-87.2)	433 (294-597)	1150 (936-1510)	2548
Total population (2007 - 2008)	18.3 (13.7-24.3)	14.3 (10.7-19.8)	64.1 (42.8-116)	365 (223-524)	801 (471-2080)	2604
Total population (2009 - 2010)	22.3 (18.0-27.7)	16.4 (12.7-20.5)	81.2 (55.0-126)	493 (320-742)	1750 (931-3120)	2749
Age 6-11 years (2003 - 2004)	21.2 (16.4-27.3)	17.2 (14.9-25.9)	66.7 (38.7-102)	158 (106-246)	246 (154-618)	314
Age 6-11 years (2005 - 2006)	21.2 (14.3-31.3)	19.4 (11.7-26.1)	58.8 (40.5-102)	259 (115-433)	852 (355-2200)	356
Age 6-11 years (2007 - 2008)	24.1 (15.0-38.7)	17.2 (11.8-25.0)	79.9 (32.9-168)	392 (129-1610)	1410 (165-43600)	389
Age 6-11 years (2009 - 2010)	21.7 (15.6-30.2)	14.6 (12.0-19.7)	52.7 (27.2-119)	470 (80.7-1900)	1570 (153-6440)	415
Age 12-19 years (2003 - 2004)	22.9 (18.0-29.3)	20.1 (16.1-25.1)	67.1 (45.2-93.8)	170 (137-240)	407 (183-717)	715
Age 12-19 years (2005 - 2006)	21.2 (15.8-28.4)	14.9 (12.1-21.4)	64.3 (39.7-95.3)	227 (130-382)	633 (252-1260)	702
Age 12-19 years (2007 - 2008)	21.5 (16.0-28.8)	15.0 (11.9-21.3)	59.3 (36.7-111)	214 (113-613)	613 (206-1350)	401
Age 12-19 years (2009 - 2010)	23.3 (16.6-32.5)	16.6 (13.1-19.7)	62.3 (35.1-129)	423 (184-843)	988 (550-2670)	420
Age 20+ years (2003 - 2004)	23.1 (18.0-29.6)	18.1 (14.7-23.3)	109 (72.1-140)	450 (315-733)	1220 (769-1750)	1488
Age 20+ years (2005 - 2006)	19.0 (16.5-21.8)	13.5 (12.0-16.3)	70.9 (55.2-87.2)	543 (390-638)	1200 (954-1690)	1490
Age 20+ years (2007 - 2008)	17.3 (13.0-23.0)	13.7 (10.0-19.5)	64.1 (41.5-117)	371 (240-516)	801 (516-1790)	1814
Age 20+ years (2009 - 2010)	22.3 (17.9-27.7)	16.5 (12.3-22.5)	86.7 (63.1-129)	505 (339-760)	1890 (1240-3170)	1914
Males (2003 - 2004)	16.8 (13.2-21.3)	13.7 (11.4-16.8)	55.3 (33.2-86.6)	178 (134-324)	567 (238-1350)	1229
Males (2005 - 2006)	14.6 (10.8-19.7)	11.8 (8.80-15.9)	43.4 (31.0-68.8)	227 (103-552)	909 (479-1190)	1270
Males (2007 - 2008)	11.9 (8.84-16.0)	9.40 (7.70-12.3)	37.6 (22.6-54.7)	172 (79.9-376)	471 (208-1410)	1294
Males (2009 - 2010)	15.3 (12.7-18.6)	12.2 (10.0-15.2)	52.8 (33.9-72.6)	223 (129-332)	610 (318-1270)	1399
Females (2003 - 2004)	30.7 (23.7-39.8)	26.0 (20.2-34.1)	137 (106-172)	596 (403-769)	1340 (776-1790)	1288
Females (2005 - 2006)	25.5 (21.7-29.9)	17.9 (14.3-23.1)	129 (82.9-166)	638 (478-900)	1410 (945-2620)	1278
Females (2007 - 2008)	27.6 (20.4-37.3)	25.6 (17.5-33.9)	117 (72.6-211)	535 (361-757)	1260 (643-2280)	1310
Females (2009 - 2010)	32.0 (23.7-43.3)	23.0 (16.4-29.8)	148 (73.3-260)	1020 (540-1800)	3200 (1760-4400)	1350
Mexican Americans (2003 - 2004)	16.5 (10.9-25.1)	11.9 (8.50-18.3)	45.5 (25.9-78.2)	178 (76.4-412)	412 (178-2180)	613
Mexican Americans (2005 - 2006)	14.3 (10.7-19.1)	10.2 (7.40-14.1)	45.6 (24.1-75.7)	214 (166-313)	635 (337-1090)	637
Mexican Americans (2007 - 2008)	12.1 (9.49-15.3)	9.90 (7.70-12.4)	32.6 (25.0-48.3)	142 (85.0-268)	409 (214-778)	531
Mexican Americans (2009 - 2010)	17.2 (13.7-21.6)	12.5 (10.5-14.5)	41.9 (30.2-57.4)	351 (248-546)	1130 (493-2140)	566
Non-Hispanic blacks (2003 - 2004)	12.8 (9.38-17.4)	10.2 (7.40-14.4)	34.3 (22.8-50.6)	127 (90.8-176)	247 (143-499)	652
Non-Hispanic blacks (2005 - 2006)	12.4 (9.77-15.6)	9.40 (7.30-11.8)	33.0 (22.3-46.5)	208 (115-291)	556 (269-1060)	678
Non-Hispanic blacks (2007 - 2008)	8.55 (6.75-10.8)	7.40 (5.00-9.70)	25.5 (17.5-34.5)	117 (66.8-217)	422 (195-786)	597
Non-Hispanic blacks (2009 - 2010)	14.0 (10.9-18.1)	8.90 (7.30-10.5)	30.9 (21.9-50.5)	276 (143-437)	705 (320-3000)	516
Non-Hispanic whites (2003 - 2004)	27.7 (20.3-37.8)	24.4 (16.8-32.0)	121 (83.6-162)	507 (316-769)	1340 (733-2070)	1092
Non-Hispanic whites (2005 - 2006)	21.6 (18.5-25.2)	16.0 (13.5-19.0)	82.4 (64.2-114)	552 (392-754)	1370 (945-2050)	1038
Non-Hispanic whites (2007 - 2008)	23.1 (15.0-35.5)	18.7 (11.0-33.7)	101 (47.4-206)	459 (241-749)	1160 (487-2620)	1077
Non-Hispanic whites (2009 - 2010)	26.1 (19.0-35.9)	21.1 (14.6-29.7)	94.9 (59.8-186)	610 (325-1240)	2130 (934-3820)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.3, 0.4, 0.4, and 0.4 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzophenone-3_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Benzophenone-3_FactSheet.html

Urinary Benzophenone-3 (2011 – 2014)

CAS Number 131-57-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	23.2 (17.2-31.3)	18.7 (13.6-27.0)	83.8 (50.8-142)	461 (290-861)	1200 (861-1610)	2489
Total population (2013 - 2014)	25.2 (20.4-31.2)	21.0 (16.8-25.3)	87.9 (72.7-102)	417 (269-642)	1210 (853-1760)	2686
Age 6-11 years (2011 - 2012)	18.7 (12.3-28.2)	13.2 (8.20-20.8)	55.4 (28.0-108)	336 (134-653)	657 (236-1270)	396
Age 6-11 years (2013 - 2014)	26.0 (16.5-40.9)	19.2 (14.4-30.0)	77.6 (39.0-206)	363 (171-720)	824 (271-1840)	409
Age 12-19 years (2011 - 2012)	27.8 (15.4-50.2)	21.6 (10.8-42.1)	109 (34.0-255)	433 (159-1160)	1120 (261-1990)	388
Age 12-19 years (2013 - 2014)	29.2 (23.3-36.4)	26.2 (19.7-36.4)	87.2 (57.8-137)	261 (167-504)	537 (269-1340)	462
Age 20+ years (2011 - 2012)	23.1 (17.8-30.0)	19.2 (14.4-27.0)	83.8 (52.8-137)	482 (305-805)	1250 (975-1640)	1705
Age 20+ years (2013 - 2014)	24.6 (19.7-30.6)	20.1 (16.0-24.7)	90.6 (73.4-102)	482 (294-801)	1360 (875-2740)	1815
Males (2011 - 2012)	17.2 (12.1-24.5)	16.0 (9.40-23.6)	50.2 (40.1-78.7)	295 (141-448)	594 (301-1360)	1259
Males (2013 - 2014)	19.0 (15.8-22.9)	16.8 (14.4-19.8)	55.0 (46.4-63.1)	231 (176-259)	576 (340-864)	1285
Females (2011 - 2012)	31.0 (22.7-42.2)	22.2 (16.0-34.1)	137 (79.9-243)	781 (467-1220)	1720 (1260-2290)	1230
Females (2013 - 2014)	32.9 (24.9-43.5)	26.2 (19.4-37.2)	120 (94.9-195)	733 (447-1230)	1950 (1200-3460)	1401
Mexican Americans (2011 - 2012)	16.8 (10.5-26.8)	13.4 (7.20-25.2)	46.1 (25.2-115)	305 (111-644)	885 (305-1740)	316
Mexican Americans (2013 - 2014)	25.9 (20.5-32.7)	19.0 (15.0-24.2)	69.3 (44.1-86.6)	256 (204-538)	893 (518-1230)	438
Non-Hispanic blacks (2011 - 2012)	14.5 (11.4-18.5)	10.9 (8.00-14.1)	41.4 (28.8-59.5)	316 (192-433)	895 (475-1270)	665
Non-Hispanic blacks (2013 - 2014)	10.9 (7.48-15.8)	9.60 (6.60-13.1)	26.9 (19.6-39.9)	104 (60.3-205)	448 (118-1070)	609
Non-Hispanic whites (2011 - 2012)	26.8 (17.8-40.5)	22.2 (14.8-36.5)	101 (52.8-216)	512 (255-1130)	1230 (805-1830)	813
Non-Hispanic whites (2013 - 2014)	29.7 (22.7-38.8)	24.9 (19.5-32.9)	108 (94.0-131)	523 (340-853)	1470 (1150-2860)	988
All Hispanics (2011 - 2012)	21.2 (15.2-29.4)	16.3 (10.6-22.7)	57.9 (38.2-126)	408 (261-684)	1020 (527-1610)	571
All Hispanics (2013 - 2014)	28.2 (23.8-33.4)	20.1 (16.5-23.9)	81.5 (64.7-98.3)	415 (219-824)	1120 (738-1780)	690
Asians (2011 - 2012)	16.7 (10.5-26.5)	11.9 (7.30-21.1)	66.4 (37.6-122)	486 (157-1350)	1640 (770-2780)	352
Asians (2013 - 2014)	18.6 (12.4-28.0)	17.0 (8.30-26.8)	64.2 (36.1-107)	254 (114-532)	532 (283-1770)	289

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 13-14 are 0.4 and 0.4, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzophenone-3_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Benzophenone-3_FactSheet.html

Urinary Benzophenone-3 (creatinine corrected) (2003 – 2010)

CAS Number 131-57-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	22.2 (17.6-28.0)	16.2 (12.7-21.6)	82.0 (58.7-108)	415 (283-577)	1080 (686-1600)	2514
Total population (2005 - 2006)	18.9 (15.8-22.6)	13.5 (11.2-16.8)	60.4 (47.6-81.4)	445 (346-553)	1210 (794-1970)	2548
Total population (2007 - 2008)	18.4 (13.9-24.4)	13.5 (10.2-17.8)	67.9 (45.2-117)	338 (215-584)	935 (525-1800)	2604
Total population (2009 - 2010)	23.3 (18.7-29.1)	16.1 (12.8-19.8)	79.1 (52.2-124)	579 (355-1040)	2340 (1380-3010)	2749
Age 6-11 years (2003 - 2004)	25.8 (19.5-34.1)	22.4 (14.4-33.7)	84.6 (41.0-131)	171 (132-365)	427 (171-710)	314
Age 6-11 years (2005 - 2006)	23.3 (15.9-34.1)	17.5 (11.6-28.3)	67.7 (39.7-105)	249 (106-631)	868 (264-2080)	356
Age 6-11 years (2007 - 2008)	29.7 (19.0-46.6)	19.3 (12.4-32.3)	103 (51.1-159)	442 (133-1550)	1430 (187-29100)	389
Age 6-11 years (2009 - 2010)	28.3 (20.4-39.4)	18.8 (14.7-21.1)	53.9 (33.2-132)	565 (104-3410)	1780 (253-8230)	415
Age 12-19 years (2003 - 2004)	17.2 (13.7-21.5)	12.9 (10.4-16.5)	43.6 (29.5-57.7)	136 (91.7-239)	350 (173-646)	713
Age 12-19 years (2005 - 2006)	15.8 (11.6-21.6)	12.1 (9.16-17.0)	42.5 (28.6-58.7)	164 (101-438)	625 (225-956)	702
Age 12-19 years (2007 - 2008)	16.7 (12.4-22.4)	12.1 (8.57-17.6)	55.7 (30.4-74.8)	211 (88.2-505)	505 (163-902)	401
Age 12-19 years (2009 - 2010)	18.7 (13.4-26.1)	13.6 (10.1-19.7)	39.9 (25.5-91.6)	412 (89.8-750)	1240 (629-2540)	420
Age 20+ years (2003 - 2004)	22.8 (17.8-29.1)	16.2 (12.7-21.9)	93.2 (66.0-130)	491 (361-700)	1330 (880-1880)	1487
Age 20+ years (2005 - 2006)	19.0 (16.3-22.2)	13.4 (11.2-16.2)	64.2 (49.3-87.0)	509 (406-628)	1480 (816-2200)	1490
Age 20+ years (2007 - 2008)	17.7 (13.3-23.6)	12.6 (9.93-17.5)	67.7 (44.1-127)	362 (249-584)	960 (581-1970)	1814
Age 20+ years (2009 - 2010)	23.6 (18.8-29.5)	16.3 (12.7-20.2)	83.6 (58.3-146)	602 (364-1230)	2470 (1350-3080)	1914
Males (2003 - 2004)	13.6 (10.8-17.1)	10.3 (8.36-12.9)	40.0 (24.9-62.5)	169 (93.3-316)	381 (229-685)	1228
Males (2005 - 2006)	11.7 (8.74-15.8)	9.43 (6.72-12.5)	31.9 (19.7-49.4)	176 (77.1-406)	553 (317-948)	1270
Males (2007 - 2008)	10.0 (7.37-13.7)	7.50 (5.74-10.0)	28.7 (18.5-47.3)	142 (65.8-225)	332 (181-960)	1294
Males (2009 - 2010)	13.7 (11.4-16.6)	10.7 (8.53-12.7)	44.6 (29.7-57.4)	186 (123-287)	420 (287-1230)	1399
Females (2003 - 2004)	35.5 (27.1-46.4)	28.2 (20.2-37.0)	144 (101-224)	686 (491-1130)	1850 (1220-2580)	1286
Females (2005 - 2006)	30.0 (25.3-35.6)	20.9 (17.0-29.0)	129 (88.0-175)	707 (527-912)	1880 (1150-2770)	1278
Females (2007 - 2008)	33.0 (25.0-43.7)	26.2 (19.1-41.1)	156 (90.2-235)	617 (385-935)	1500 (746-2710)	1310
Females (2009 - 2010)	38.6 (28.1-53.0)	25.7 (17.5-35.2)	161 (76.3-378)	1580 (955-2410)	3250 (2540-4640)	1350
Mexican Americans (2003 - 2004)	15.1 (9.44-24.0)	11.1 (6.95-16.0)	40.7 (18.3-85.8)	158 (87.4-362)	595 (118-1860)	612
Mexican Americans (2005 - 2006)	12.9 (10.2-16.2)	8.63 (6.16-12.5)	32.1 (23.1-51.8)	216 (135-408)	948 (441-1220)	637
Mexican Americans (2007 - 2008)	11.8 (8.87-15.6)	8.97 (7.00-12.4)	33.6 (26.0-43.2)	154 (93.4-249)	413 (217-932)	531
Mexican Americans (2009 - 2010)	17.1 (13.4-21.7)	12.2 (9.64-14.5)	40.4 (26.4-60.3)	288 (155-603)	1310 (441-2180)	566
Non-Hispanic blacks (2003 - 2004)	8.78 (6.49-11.9)	6.80 (5.27-9.00)	19.7 (13.5-33.4)	79.8 (46.8-139)	185 (79.8-536)	651
Non-Hispanic blacks (2005 - 2006)	8.69 (7.02-10.8)	6.29 (5.52-7.78)	21.2 (14.5-34.5)	118 (74.9-245)	448 (208-876)	678
Non-Hispanic blacks (2007 - 2008)	6.65 (5.24-8.42)	5.09 (4.15-6.10)	17.8 (13.2-24.2)	86.6 (57.5-122)	297 (113-903)	597
Non-Hispanic blacks (2009 - 2010)	10.2 (8.12-12.7)	6.46 (5.40-7.67)	23.1 (15.5-38.2)	160 (79.9-396)	653 (305-1580)	516
Non-Hispanic whites (2003 - 2004)	28.3 (20.6-38.8)	22.0 (14.6-32.7)	116 (73.5-175)	510 (380-760)	1330 (852-2410)	1091
Non-Hispanic whites (2005 - 2006)	22.7 (19.4-26.7)	16.2 (13.0-19.7)	77.3 (56.5-106)	538 (406-679)	1500 (828-2430)	1038
Non-Hispanic whites (2007 - 2008)	24.1 (15.6-37.2)	18.1 (11.0-30.0)	103 (53.6-198)	494 (227-960)	1170 (522-2710)	1077
Non-Hispanic whites (2009 - 2010)	29.3 (20.7-41.5)	22.1 (14.6-33.1)	99.2 (54.3-241)	767 (412-1550)	2590 (1510-3250)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzophenone-3_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Benzophenone-3_FactSheet.html

Urinary Benzophenone-3 (creatinine corrected) (2011 – 2014)

CAS Number 131-57-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	26.4 (19.3-36.2)	18.8 (13.3-27.3)	102 (57.8-162)	613 (330-1020)	1680 (1010-2500)	2487
Total population (2013 - 2014)	25.2 (20.5-31.0)	19.8 (15.7-24.7)	79.8 (66.2-103)	467 (299-603)	1190 (847-1810)	2684
Age 6-11 years (2011 - 2012)	26.9 (17.9-40.2)	18.8 (13.0-28.6)	67.8 (37.8-135)	552 (138-1010)	1010 (297-1670)	395
Age 6-11 years (2013 - 2014)	32.8 (21.5-50.1)	28.8 (16.7-45.7)	90.0 (46.9-189)	401 (152-868)	868 (432-1700)	409
Age 12-19 years (2011 - 2012)	27.1 (14.2-51.8)	16.7 (8.69-44.3)	102 (29.9-331)	631 (117-3050)	1720 (331-3900)	388
Age 12-19 years (2013 - 2014)	23.7 (17.8-31.4)	21.6 (15.8-28.7)	63.0 (49.1-86.2)	221 (116-440)	506 (221-647)	462
Age 20+ years (2011 - 2012)	26.3 (19.8-34.8)	19.8 (13.9-26.6)	107 (68.1-156)	640 (371-957)	1890 (1080-2500)	1704
Age 20+ years (2013 - 2014)	24.7 (20.3-30.0)	18.8 (15.2-23.1)	82.3 (69.5-102)	529 (317-790)	1420 (915-2660)	1813
Males (2011 - 2012)	16.1 (11.3-22.8)	11.9 (8.77-18.1)	48.8 (31.6-84.5)	237 (120-442)	716 (267-1030)	1258
Males (2013 - 2014)	15.9 (13.2-19.3)	13.8 (10.9-17.5)	44.0 (33.1-58.5)	181 (146-229)	432 (299-532)	1284
Females (2011 - 2012)	42.7 (30.6-59.5)	30.1 (19.7-49.4)	186 (107-374)	1150 (771-1910)	2720 (1660-4230)	1229
Females (2013 - 2014)	38.9 (29.2-51.8)	29.7 (21.3-39.9)	153 (83.6-242)	905 (603-1250)	2550 (1440-3500)	1400
Mexican Americans (2011 - 2012)	18.9 (12.4-29.0)	13.8 (8.75-22.0)	45.3 (23.5-132)	369 (132-820)	1030 (371-2330)	316
Mexican Americans (2013 - 2014)	26.4 (20.2-34.4)	18.2 (15.6-23.2)	59.1 (40.6-82.7)	296 (122-1090)	1180 (473-2130)	438
Non-Hispanic blacks (2011 - 2012)	11.3 (8.82-14.5)	7.48 (6.04-9.49)	27.6 (18.0-42.1)	269 (159-376)	747 (376-1010)	665
Non-Hispanic blacks (2013 - 2014)	8.02 (5.57-11.5)	6.43 (4.68-8.60)	16.9 (11.6-24.7)	93.5 (51.1-204)	332 (144-818)	609
Non-Hispanic whites (2011 - 2012)	32.6 (21.1-50.4)	25.5 (15.3-41.1)	128 (70.8-248)	793 (334-1320)	1970 (1030-3500)	811
Non-Hispanic whites (2013 - 2014)	31.2 (24.5-39.6)	25.3 (20.1-31.5)	115 (77.3-159)	569 (432-765)	1270 (871-2550)	987
All Hispanics (2011 - 2012)	23.7 (17.6-32.0)	15.9 (11.4-21.7)	65.0 (38.6-132)	425 (265-916)	1850 (784-2330)	571
All Hispanics (2013 - 2014)	28.0 (23.2-33.7)	18.8 (16.3-22.5)	66.8 (50.9-84.5)	338 (190-1020)	1380 (974-2740)	690
Asians (2011 - 2012)	22.3 (14.3-34.9)	14.2 (8.24-27.8)	73.1 (41.6-153)	624 (282-1640)	1860 (641-4410)	352
Asians (2013 - 2014)	23.1 (16.3-32.8)	20.2 (12.9-34.4)	67.5 (48.4-102)	253 (131-537)	657 (287-1900)	288

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzophenone-3_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Benzophenone-3_FactSheet.html

Urinary Bisphenol A (2003 – 2010)

CAS Number 80-05-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	2.64 (2.38-2.94)	2.80 (2.50-3.10)	5.50 (5.00-6.20)	10.6 (9.40-12.0)	16.0 (14.4-17.2)	2517
Total population (2005 - 2006)	1.90 (1.79-2.02)	2.00 (1.90-2.00)	3.70 (3.50-3.90)	7.00 (6.40-7.60)	11.5 (10.0-13.6)	2548
Total population (2007 - 2008)	2.08 (1.92-2.26)	2.10 (1.90-2.30)	4.10 (3.60-4.60)	7.70 (6.80-8.70)	13.0 (10.0-15.6)	2604
Total population (2009 - 2010)	1.83 (1.72-1.94)	1.90 (1.70-2.00)	3.50 (3.30-3.80)	6.60 (6.00-7.20)	9.60 (8.50-11.3)	2749
Age 6-11 years (2003 - 2004)	3.55 (2.95-4.29)	3.80 (2.70-5.00)	6.90 (6.00-8.30)	12.6 (9.50-15.1)	16.0 (11.5-23.3)	314
Age 6-11 years (2005 - 2006)	2.86 (2.52-3.24)	2.70 (2.30-2.90)	5.00 (4.40-5.80)	13.5 (9.30-16.8)	22.8 (13.6-34.6)	356
Age 6-11 years (2007 - 2008)	2.48 (2.21-2.77)	2.40 (1.90-3.00)	4.50 (3.70-5.50)	7.60 (6.30-9.50)	13.4 (8.80-17.8)	389
Age 6-11 years (2009 - 2010)	1.81 (1.55-2.10)	1.70 (1.50-2.00)	3.40 (3.00-4.00)	6.50 (4.30-9.70)	9.20 (6.50-15.1)	415
Age 12-19 years (2003 - 2004)	3.74 (3.31-4.22)	4.30 (3.60-4.60)	7.80 (6.50-9.00)	13.5 (11.8-15.2)	16.5 (15.2-20.9)	715
Age 12-19 years (2005 - 2006)	2.42 (2.18-2.68)	2.40 (2.10-2.70)	4.30 (3.90-5.20)	8.40 (6.50-10.8)	11.9 (10.7-14.8)	702
Age 12-19 years (2007 - 2008)	2.45 (2.14-2.80)	2.40 (2.10-2.60)	4.40 (3.60-5.50)	9.70 (7.30-11.9)	12.2 (9.70-19.0)	401
Age 12-19 years (2009 - 2010)	2.11 (1.86-2.40)	2.20 (1.90-2.40)	3.80 (3.20-4.50)	6.90 (4.70-10.8)	11.1 (6.90-21.0)	420
Age 20+ years (2003 - 2004)	2.41 (2.15-2.72)	2.60 (2.30-2.80)	5.10 (4.50-5.70)	9.50 (8.10-11.3)	15.2 (12.4-18.1)	1488
Age 20+ years (2005 - 2006)	1.75 (1.62-1.89)	1.80 (1.70-2.00)	3.40 (3.10-3.70)	6.40 (5.80-7.50)	10.7 (8.80-12.1)	1490
Age 20+ years (2007 - 2008)	1.99 (1.82-2.18)	2.00 (1.80-2.30)	3.90 (3.40-4.60)	7.40 (6.60-8.50)	13.2 (9.10-15.7)	1814
Age 20+ years (2009 - 2010)	1.79 (1.67-1.93)	1.80 (1.60-2.00)	3.50 (3.30-3.70)	6.50 (6.00-7.20)	9.60 (8.30-11.3)	1914
Males (2003 - 2004)	2.92 (2.63-3.24)	3.20 (2.70-3.60)	6.10 (5.40-6.60)	10.4 (9.50-11.6)	16.0 (12.7-17.6)	1229
Males (2005 - 2006)	2.09 (1.92-2.28)	2.10 (2.00-2.30)	3.70 (3.40-4.20)	7.70 (6.80-9.30)	12.8 (10.1-15.8)	1270
Males (2007 - 2008)	2.20 (2.01-2.41)	2.10 (1.90-2.40)	4.00 (3.60-4.70)	8.10 (6.70-9.70)	14.0 (8.70-20.8)	1294
Males (2009 - 2010)	1.94 (1.82-2.07)	1.90 (1.70-2.00)	3.70 (3.40-4.10)	6.90 (5.90-7.90)	10.9 (8.40-13.5)	1399
Females (2003 - 2004)	2.41 (2.11-2.75)	2.50 (2.20-2.80)	5.00 (4.20-6.20)	10.6 (8.70-12.5)	15.9 (13.5-20.1)	1288
Females (2005 - 2006)	1.74 (1.55-1.95)	1.80 (1.60-2.00)	3.70 (3.10-4.00)	6.20 (5.80-7.60)	10.4 (7.70-14.7)	1278
Females (2007 - 2008)	1.97 (1.80-2.16)	2.00 (1.80-2.20)	4.10 (3.60-4.60)	7.40 (6.80-8.20)	12.0 (9.60-14.1)	1310
Females (2009 - 2010)	1.73 (1.60-1.87)	1.80 (1.60-2.00)	3.40 (3.20-3.70)	6.50 (5.60-7.10)	9.20 (8.00-11.2)	1350
Mexican Americans (2003 - 2004)	2.58 (2.15-3.08)	2.60 (2.10-3.20)	5.20 (4.40-6.50)	9.90 (7.30-13.9)	15.4 (10.2-19.7)	613
Mexican Americans (2005 - 2006)	2.05 (1.75-2.40)	2.00 (1.70-2.40)	3.60 (3.00-4.20)	6.90 (5.40-10.1)	12.2 (8.00-15.6)	637
Mexican Americans (2007 - 2008)	2.09 (1.94-2.26)	2.00 (1.80-2.30)	3.80 (3.30-4.30)	7.10 (6.10-8.60)	11.7 (7.70-14.6)	531
Mexican Americans (2009 - 2010)	1.92 (1.69-2.19)	2.10 (1.80-2.30)	3.50 (3.10-4.10)	6.50 (5.20-7.50)	9.00 (6.90-16.2)	566
Non-Hispanic blacks (2003 - 2004)	4.24 (3.73-4.82)	4.30 (3.80-5.10)	8.20 (7.10-9.80)	14.2 (11.7-16.9)	20.6 (14.9-25.2)	652
Non-Hispanic blacks (2005 - 2006)	2.50 (2.25-2.77)	2.70 (2.30-3.00)	4.60 (4.00-5.00)	8.00 (6.80-9.30)	11.3 (8.90-14.2)	678
Non-Hispanic blacks (2007 - 2008)	2.66 (2.38-2.97)	2.80 (2.60-3.10)	5.40 (4.40-6.40)	9.10 (7.50-10.4)	13.3 (10.0-15.1)	597
Non-Hispanic blacks (2009 - 2010)	2.51 (2.22-2.83)	2.60 (2.30-3.00)	4.40 (3.80-5.00)	7.30 (6.10-8.80)	10.3 (7.90-13.6)	516
Non-Hispanic whites (2003 - 2004)	2.51 (2.26-2.79)	2.70 (2.50-3.00)	5.20 (4.70-5.80)	9.60 (8.30-10.9)	15.1 (12.6-16.7)	1092
Non-Hispanic whites (2005 - 2006)	1.76 (1.62-1.91)	1.80 (1.60-2.00)	3.50 (3.20-3.80)	6.80 (5.90-7.60)	11.0 (8.80-13.7)	1038
Non-Hispanic whites (2007 - 2008)	2.06 (1.87-2.27)	2.00 (1.80-2.30)	4.00 (3.40-4.70)	7.80 (6.70-8.90)	13.7 (9.80-16.1)	1077
Non-Hispanic whites (2009 - 2010)	1.73 (1.60-1.87)	1.70 (1.60-1.90)	3.40 (3.10-3.70)	6.40 (5.40-7.60)	9.20 (8.20-11.2)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.4, 0.4, 0.4, and 0.4 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BisphenolA_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/BisphenolA_FactSheet.html

Urinary Bisphenol A (2011 – 2014)

CAS Number 80-05-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.51 (1.41-1.62)	1.40 (1.30-1.60)	3.00 (2.70-3.30)	5.60 (4.90-6.50)	9.40 (7.70-11.2)	2489
Total population (2013 - 2014)	1.28 (1.20-1.36)	1.30 (1.20-1.40)	2.50 (2.40-2.70)	4.90 (4.10-5.60)	7.70 (6.80-8.30)	2686
Age 6-11 years (2011 - 2012)	1.58 (1.41-1.78)	1.50 (1.30-1.70)	3.10 (2.60-3.50)	6.70 (5.10-8.00)	8.70 (6.20-21.4)	396
Age 6-11 years (2013 - 2014)	1.43 (1.30-1.59)	1.40 (1.30-1.60)	2.90 (2.30-3.40)	4.40 (4.10-5.20)	8.00 (5.20-10.2)	409
Age 12-19 years (2011 - 2012)	1.69 (1.42-2.00)	1.70 (1.30-2.10)	3.30 (2.80-4.00)	6.90 (4.80-7.90)	10.0 (7.10-13.0)	388
Age 12-19 years (2013 - 2014)	1.28 (1.16-1.41)	1.20 (1.10-1.40)	2.40 (1.90-2.70)	4.60 (3.30-5.20)	6.80 (5.20-8.10)	462
Age 20+ years (2011 - 2012)	1.48 (1.35-1.61)	1.40 (1.20-1.60)	2.90 (2.50-3.30)	5.40 (4.70-6.30)	9.30 (7.30-12.2)	1705
Age 20+ years (2013 - 2014)	1.26 (1.18-1.35)	1.30 (1.20-1.40)	2.50 (2.40-2.80)	4.90 (4.10-6.00)	7.80 (6.80-8.60)	1815
Males (2011 - 2012)	1.64 (1.49-1.81)	1.50 (1.40-1.70)	3.20 (2.70-3.70)	6.00 (5.00-7.70)	9.50 (7.80-11.2)	1259
Males (2013 - 2014)	1.43 (1.30-1.58)	1.40 (1.30-1.60)	2.80 (2.40-3.20)	5.30 (4.30-6.60)	8.30 (6.80-10.3)	1285
Females (2011 - 2012)	1.39 (1.25-1.55)	1.30 (1.20-1.50)	2.80 (2.40-3.20)	5.20 (4.30-6.30)	8.50 (6.50-13.4)	1230
Females (2013 - 2014)	1.15 (1.05-1.26)	1.20 (1.10-1.30)	2.30 (2.00-2.60)	4.20 (3.80-5.20)	7.20 (5.60-8.10)	1401
Mexican Americans (2011 - 2012)	1.45 (1.30-1.63)	1.40 (1.20-1.60)	2.80 (2.30-3.10)	5.00 (4.20-6.50)	7.70 (5.90-9.70)	316
Mexican Americans (2013 - 2014)	1.28 (1.06-1.53)	1.30 (1.00-1.70)	2.50 (2.10-2.80)	4.10 (3.50-4.90)	5.60 (4.60-7.30)	438
Non-Hispanic blacks (2011 - 2012)	2.12 (1.88-2.38)	2.00 (1.80-2.40)	4.10 (3.40-4.60)	7.10 (5.70-8.10)	11.4 (8.10-14.3)	665
Non-Hispanic blacks (2013 - 2014)	1.83 (1.62-2.07)	1.90 (1.50-2.20)	3.60 (3.20-4.10)	6.80 (5.70-7.80)	9.80 (7.70-12.9)	609
Non-Hispanic whites (2011 - 2012)	1.46 (1.34-1.58)	1.30 (1.20-1.50)	2.90 (2.50-3.20)	5.40 (4.60-6.60)	8.90 (6.90-13.4)	813
Non-Hispanic whites (2013 - 2014)	1.22 (1.13-1.31)	1.30 (1.10-1.40)	2.40 (2.20-2.70)	4.40 (3.90-5.90)	7.40 (6.40-8.30)	988
All Hispanics (2011 - 2012)	1.48 (1.25-1.74)	1.40 (1.20-1.70)	2.80 (2.20-3.40)	5.70 (4.20-7.30)	9.10 (6.50-14.1)	571
All Hispanics (2013 - 2014)	1.31 (1.18-1.46)	1.30 (1.10-1.50)	2.60 (2.20-2.80)	4.10 (3.70-4.70)	6.10 (4.90-7.50)	690
Asians (2011 - 2012)	1.03 (.863-1.23)	.900 (.800-1.10)	1.80 (1.50-2.20)	4.00 (2.40-6.40)	7.30 (3.90-11.9)	352
Asians (2013 - 2014)	.782 (.646-.948)	.800 (.700-.900)	1.40 (1.00-1.80)	2.40 (1.80-3.30)	3.60 (2.40-12.1)	289

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 13-14 are 0.4 and 0.2, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BisphenolA_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/BisphenolA_FactSheet.html

Urinary Bisphenol A (creatinine corrected) (2003 – 2010)

CAS Number 80-05-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	2.58 (2.36-2.82)	2.50 (2.31-2.80)	4.29 (3.88-4.75)	7.67 (6.62-8.66)	11.2 (9.78-12.4)	2514
Total population (2005 - 2006)	1.86 (1.79-1.92)	1.71 (1.64-1.79)	3.01 (2.86-3.20)	5.73 (5.29-6.36)	9.70 (8.31-10.9)	2548
Total population (2007 - 2008)	2.10 (1.95-2.25)	1.95 (1.84-2.03)	3.45 (3.02-3.83)	6.09 (5.10-7.45)	10.0 (7.48-13.2)	2604
Total population (2009 - 2010)	1.91 (1.79-2.04)	1.76 (1.67-1.84)	3.06 (2.80-3.33)	5.33 (4.68-6.06)	8.03 (6.94-10.0)	2749
Age 6-11 years (2003 - 2004)	4.32 (3.63-5.14)	4.29 (3.63-5.23)	7.14 (5.83-9.56)	12.2 (9.84-14.8)	15.7 (12.2-23.2)	314
Age 6-11 years (2005 - 2006)	3.14 (2.79-3.54)	2.80 (2.55-3.06)	5.04 (4.46-5.71)	15.6 (8.15-22.4)	24.6 (19.9-48.5)	356
Age 6-11 years (2007 - 2008)	3.05 (2.73-3.41)	2.69 (2.38-3.12)	5.06 (4.33-5.60)	11.9 (6.30-17.4)	20.8 (12.7-26.3)	389
Age 6-11 years (2009 - 2010)	2.36 (2.09-2.65)	2.18 (2.00-2.53)	3.70 (3.14-4.29)	5.97 (4.57-9.15)	9.57 (6.52-13.7)	415
Age 12-19 years (2003 - 2004)	2.80 (2.52-3.11)	2.74 (2.35-3.22)	4.74 (4.21-5.09)	7.79 (6.41-8.87)	11.8 (8.05-14.2)	713
Age 12-19 years (2005 - 2006)	1.80 (1.67-1.95)	1.65 (1.50-1.76)	2.73 (2.41-2.98)	5.71 (4.07-7.50)	8.52 (6.94-12.2)	702
Age 12-19 years (2007 - 2008)	1.90 (1.72-2.10)	1.69 (1.50-2.00)	2.94 (2.38-3.60)	5.10 (4.17-6.82)	7.72 (5.32-13.9)	401
Age 12-19 years (2009 - 2010)	1.70 (1.47-1.95)	1.60 (1.34-1.88)	2.63 (2.11-3.58)	4.47 (3.76-6.19)	6.71 (4.40-17.8)	420
Age 20+ years (2003 - 2004)	2.39 (2.17-2.64)	2.36 (2.15-2.59)	3.93 (3.44-4.33)	6.64 (5.97-7.74)	10.0 (9.01-11.4)	1487
Age 20+ years (2005 - 2006)	1.75 (1.67-1.84)	1.64 (1.56-1.75)	2.84 (2.67-3.08)	5.38 (4.89-5.87)	8.54 (7.58-9.77)	1490
Age 20+ years (2007 - 2008)	2.04 (1.90-2.20)	1.92 (1.79-2.03)	3.36 (2.91-3.78)	6.02 (4.88-7.48)	9.32 (7.48-12.1)	1814
Age 20+ years (2009 - 2010)	1.90 (1.76-2.05)	1.76 (1.66-1.84)	3.04 (2.76-3.24)	5.33 (4.67-6.11)	8.00 (6.97-10.0)	1914
Males (2003 - 2004)	2.38 (2.15-2.63)	2.31 (2.08-2.70)	4.19 (3.81-4.64)	7.10 (6.41-8.28)	9.94 (9.06-11.7)	1228
Males (2005 - 2006)	1.68 (1.57-1.80)	1.56 (1.45-1.64)	2.73 (2.43-3.14)	5.27 (4.64-6.04)	8.40 (6.81-11.4)	1270
Males (2007 - 2008)	1.85 (1.71-2.01)	1.77 (1.57-1.91)	2.97 (2.59-3.33)	5.41 (4.47-7.51)	9.52 (6.29-13.4)	1294
Males (2009 - 2010)	1.74 (1.62-1.87)	1.60 (1.48-1.72)	2.76 (2.53-2.96)	5.00 (4.16-5.86)	7.50 (6.22-9.00)	1399
Females (2003 - 2004)	2.78 (2.50-3.08)	2.68 (2.40-2.94)	4.41 (3.81-5.15)	7.93 (6.48-10.2)	12.4 (9.29-18.2)	1286
Females (2005 - 2006)	2.04 (1.95-2.14)	1.85 (1.76-2.02)	3.21 (2.98-3.39)	6.47 (5.51-7.50)	9.86 (8.62-11.8)	1278
Females (2007 - 2008)	2.36 (2.17-2.57)	2.14 (1.98-2.33)	3.77 (3.43-4.31)	6.67 (5.41-7.83)	10.5 (7.45-15.2)	1310
Females (2009 - 2010)	2.09 (1.92-2.27)	1.93 (1.80-2.15)	3.33 (2.94-3.84)	5.49 (4.87-6.74)	8.80 (6.47-12.5)	1350
Mexican Americans (2003 - 2004)	2.34 (2.02-2.71)	2.38 (2.00-2.65)	3.85 (3.24-4.55)	7.09 (5.00-9.04)	10.9 (8.50-14.3)	612
Mexican Americans (2005 - 2006)	1.84 (1.66-2.04)	1.62 (1.45-1.84)	2.99 (2.56-3.60)	6.00 (4.51-8.00)	10.3 (6.84-14.9)	637
Mexican Americans (2007 - 2008)	2.04 (1.86-2.24)	1.88 (1.72-2.11)	3.33 (2.96-3.95)	5.68 (5.05-6.59)	8.90 (6.30-11.8)	531
Mexican Americans (2009 - 2010)	1.91 (1.71-2.13)	1.76 (1.67-1.87)	3.13 (2.63-3.57)	5.51 (4.72-6.97)	8.71 (5.86-14.4)	566
Non-Hispanic blacks (2003 - 2004)	2.92 (2.58-3.32)	2.95 (2.51-3.27)	4.90 (4.07-6.13)	8.64 (7.53-9.63)	11.9 (10.2-13.3)	651
Non-Hispanic blacks (2005 - 2006)	1.76 (1.62-1.90)	1.68 (1.53-1.92)	2.82 (2.67-3.04)	4.56 (3.85-5.43)	6.81 (5.00-9.27)	678
Non-Hispanic blacks (2007 - 2008)	2.06 (1.91-2.23)	2.03 (1.83-2.25)	3.24 (2.86-3.78)	5.71 (5.15-6.54)	8.59 (6.54-10.9)	597
Non-Hispanic blacks (2009 - 2010)	1.82 (1.65-2.01)	1.70 (1.56-1.89)	2.90 (2.39-3.17)	4.94 (4.02-6.03)	6.74 (5.95-8.09)	516
Non-Hispanic whites (2003 - 2004)	2.58 (2.37-2.81)	2.55 (2.32-2.80)	4.30 (3.93-4.67)	7.58 (6.32-8.87)	11.0 (9.34-12.4)	1091
Non-Hispanic whites (2005 - 2006)	1.85 (1.75-1.96)	1.70 (1.60-1.82)	3.08 (2.78-3.31)	5.80 (5.13-6.72)	9.77 (7.87-11.5)	1038
Non-Hispanic whites (2007 - 2008)	2.15 (1.97-2.35)	1.97 (1.84-2.11)	3.50 (3.04-3.95)	6.44 (5.04-8.00)	10.9 (7.47-14.5)	1077
Non-Hispanic whites (2009 - 2010)	1.94 (1.79-2.10)	1.78 (1.67-1.92)	3.16 (2.80-3.59)	5.45 (4.67-6.94)	8.55 (6.73-10.0)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BisphenolA_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/BisphenolA_FactSheet.html

Urinary Bisphenol A (creatinine corrected) (2011 – 2014)

CAS Number 80-05-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.72 (1.61-1.84)	1.58 (1.46-1.71)	2.86 (2.62-3.01)	4.62 (4.12-5.65)	8.24 (6.47-11.0)	2487
Total population (2013 - 2014)	1.28 (1.18-1.39)	1.21 (1.11-1.32)	2.12 (1.92-2.33)	3.88 (3.46-4.24)	5.09 (4.65-5.96)	2684
Age 6-11 years (2011 - 2012)	2.27 (1.97-2.62)	2.00 (1.78-2.16)	3.33 (2.93-3.75)	7.94 (4.71-12.4)	14.0 (6.45-47.5)	395
Age 6-11 years (2013 - 2014)	1.81 (1.68-1.96)	1.80 (1.52-2.03)	3.10 (2.63-3.46)	4.48 (4.00-4.96)	7.03 (5.00-9.92)	409
Age 12-19 years (2011 - 2012)	1.64 (1.44-1.87)	1.48 (1.13-1.98)	2.88 (2.21-3.23)	4.50 (3.37-8.16)	8.74 (3.57-18.4)	388
Age 12-19 years (2013 - 2014)	1.04 (.887-1.21)	.932 (.809-1.19)	1.71 (1.33-2.03)	2.69 (2.28-3.33)	3.99 (3.29-4.67)	462
Age 20+ years (2011 - 2012)	1.68 (1.57-1.80)	1.55 (1.43-1.68)	2.75 (2.54-3.00)	4.55 (4.00-5.39)	7.73 (5.73-10.0)	1704
Age 20+ years (2013 - 2014)	1.27 (1.16-1.39)	1.21 (1.11-1.30)	2.09 (1.90-2.31)	3.88 (3.33-4.37)	5.09 (4.58-5.97)	1813
Males (2011 - 2012)	1.54 (1.40-1.69)	1.37 (1.20-1.59)	2.55 (2.21-2.94)	4.38 (3.75-6.00)	8.24 (6.01-11.0)	1258
Males (2013 - 2014)	1.20 (1.11-1.31)	1.12 (.988-1.25)	1.95 (1.78-2.24)	3.75 (3.25-4.29)	4.91 (4.42-7.02)	1284
Females (2011 - 2012)	1.91 (1.76-2.08)	1.75 (1.57-1.97)	2.93 (2.73-3.24)	4.94 (4.27-6.24)	8.13 (6.00-11.1)	1229
Females (2013 - 2014)	1.36 (1.23-1.51)	1.28 (1.17-1.43)	2.25 (2.03-2.48)	3.94 (3.27-4.48)	5.18 (4.50-6.07)	1400
Mexican Americans (2011 - 2012)	1.64 (1.49-1.80)	1.46 (1.32-1.64)	2.70 (2.34-3.01)	4.50 (3.45-7.00)	7.37 (4.76-11.4)	316
Mexican Americans (2013 - 2014)	1.30 (1.16-1.45)	1.27 (1.05-1.57)	2.25 (1.97-2.50)	3.57 (3.04-3.98)	4.25 (3.93-4.83)	438
Non-Hispanic blacks (2011 - 2012)	1.65 (1.48-1.84)	1.50 (1.30-1.71)	2.63 (2.11-3.17)	4.82 (3.82-6.24)	7.23 (5.98-10.7)	665
Non-Hispanic blacks (2013 - 2014)	1.35 (1.25-1.46)	1.32 (1.13-1.46)	2.17 (1.96-2.35)	3.89 (3.24-4.27)	5.00 (4.40-6.01)	609
Non-Hispanic whites (2011 - 2012)	1.77 (1.64-1.92)	1.64 (1.49-1.78)	2.90 (2.65-3.08)	4.60 (4.05-6.00)	9.00 (6.11-12.3)	811
Non-Hispanic whites (2013 - 2014)	1.28 (1.14-1.44)	1.21 (1.06-1.38)	2.13 (1.85-2.42)	3.94 (3.33-4.56)	5.60 (4.65-6.53)	987
All Hispanics (2011 - 2012)	1.66 (1.44-1.90)	1.47 (1.28-1.70)	2.80 (2.39-3.14)	4.82 (3.67-7.00)	7.69 (5.76-9.62)	571
All Hispanics (2013 - 2014)	1.30 (1.19-1.43)	1.25 (1.09-1.42)	2.20 (1.92-2.47)	3.61 (3.13-3.98)	4.54 (4.03-4.89)	690
Asians (2011 - 2012)	1.38 (1.25-1.52)	1.32 (1.16-1.40)	2.11 (1.84-2.50)	4.04 (2.80-6.25)	7.42 (4.38-12.1)	352
Asians (2013 - 2014)	.990 (.847-1.16)	.918 (.778-1.05)	1.62 (1.39-1.97)	2.71 (2.09-4.00)	4.44 (2.71-10.0)	288

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BisphenolA_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/BisphenolA_FactSheet.html

Urinary Bisphenol F (2013 – 2014)

CAS Number 80-05-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.532 (.460-.616)	.400 (.300-.500)	1.10 (.900-1.40)	4.00 (2.80-5.30)	9.80 (6.50-16.1)	2682
Age 6-11 years (2013 - 2014)	.421 (.343-.516)	.300 (.200-.400)	.900 (.600-1.30)	2.30 (1.50-3.30)	3.90 (3.00-6.10)	409
Age 12-19 years (2013 - 2014)	.567 (.458-.701)	.400 (.300-.600)	1.20 (1.00-1.50)	5.30 (2.50-8.40)	8.80 (6.50-18.7)	461
Age 20+ years (2013 - 2014)	.541 (.457-.641)	.400 (.300-.500)	1.20 (.900-1.50)	4.20 (2.60-6.30)	12.2 (6.00-21.4)	1812
Males (2013 - 2014)	.582 (.505-.671)	.400 (.400-.500)	1.20 (1.10-1.40)	5.10 (3.00-6.50)	12.4 (7.00-17.7)	1284
Females (2013 - 2014)	.489 (.401-.596)	.300 (.300-.500)	1.00 (.700-1.50)	3.30 (2.40-4.60)	8.90 (4.50-21.4)	1398
Mexican Americans (2013 - 2014)	*	.300 (<LOD-.400)	.600 (.400-1.10)	1.90 (1.00-5.10)	5.30 (1.90-14.9)	438
Non-Hispanic blacks (2013 - 2014)	.607 (.540-.683)	.400 (.400-.500)	1.30 (1.10-1.70)	5.40 (3.50-8.90)	14.6 (8.10-26.4)	608
Non-Hispanic whites (2013 - 2014)	.581 (.473-.713)	.400 (.300-.600)	1.30 (1.00-1.60)	4.30 (2.70-6.50)	12.4 (5.70-24.1)	987
All Hispanics (2013 - 2014)	*	.300 (.200-.400)	.700 (.500-1.10)	2.50 (1.40-5.90)	8.20 (4.10-18.0)	690
Asians (2013 - 2014)	*	< LOD	.400 (.300-.700)	1.10 (.600-2.00)	2.10 (1.10-7.00)	287

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.2.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Bisphenol F (creatinine corrected) (2013 – 2014)

CAS Number 80-05-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.534 (.471-.606)	.444 (.385-.515)	1.07 (.899-1.21)	3.33 (2.39-4.76)	8.39 (5.90-12.0)	2680
Age 6-11 years (2013 - 2014)	.532 (.431-.656)	.452 (.360-.636)	1.19 (.798-1.74)	2.44 (1.91-3.49)	4.76 (3.48-10.0)	409
Age 12-19 years (2013 - 2014)	.460 (.365-.580)	.388 (.287-.474)	1.06 (.680-1.46)	3.23 (1.85-5.17)	8.80 (3.31-14.4)	461
Age 20+ years (2013 - 2014)	.546 (.479-.622)	.464 (.395-.526)	1.06 (.875-1.21)	3.40 (2.29-5.03)	8.75 (5.70-13.8)	1810
Males (2013 - 2014)	.489 (.426-.563)	.398 (.311-.492)	.994 (.783-1.16)	3.98 (2.63-5.17)	9.47 (6.81-13.8)	1283
Females (2013 - 2014)	.581 (.497-.678)	.494 (.421-.583)	1.11 (.896-1.40)	3.09 (2.11-4.10)	6.97 (3.89-14.1)	1397
Mexican Americans (2013 - 2014)	*	.308 (<LOD-.400)	.667 (.497-.875)	1.75 (.995-3.61)	4.22 (2.02-6.73)	438
Non-Hispanic blacks (2013 - 2014)	.449 (.392-.515)	.350 (.304-.389)	.980 (.758-1.27)	3.24 (2.37-4.67)	8.28 (4.67-12.1)	608
Non-Hispanic whites (2013 - 2014)	.611 (.515-.726)	.517 (.424-.612)	1.14 (.994-1.43)	3.89 (2.63-6.50)	10.8 (5.90-15.3)	986
All Hispanics (2013 - 2014)	*	.308 (.255-.395)	.698 (.526-.933)	2.02 (1.41-4.05)	5.56 (3.00-16.0)	690
Asians (2013 - 2014)	*	< LOD	.672 (.492-.843)	1.31 (.843-2.90)	2.00 (1.17-7.78)	286

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Bisphenol S (2013 – 2014)

CAS Number 80-05-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.427 (.375-.487)	.400 (.300-.500)	.900 (.700-1.10)	2.10 (1.70-2.40)	3.60 (2.50-4.70)	2682
Age 6-11 years (2013 - 2014)	.351 (.306-.404)	.300 (.300-.400)	.700 (.500-.800)	1.40 (1.00-1.60)	2.10 (1.50-4.90)	409
Age 12-19 years (2013 - 2014)	.400 (.332-.482)	.400 (.300-.500)	.800 (.600-1.10)	1.80 (1.20-2.40)	3.20 (1.80-8.30)	461
Age 20+ years (2013 - 2014)	.441 (.381-.510)	.400 (.400-.500)	.900 (.800-1.10)	2.10 (1.80-2.50)	3.80 (2.60-4.60)	1812
Males (2013 - 2014)	.455 (.393-.527)	.400 (.400-.500)	.900 (.700-1.10)	2.30 (1.60-2.60)	3.90 (2.40-6.40)	1284
Females (2013 - 2014)	.403 (.343-.473)	.400 (.300-.500)	.900 (.700-1.10)	2.00 (1.50-2.30)	3.40 (2.40-4.60)	1398
Mexican Americans (2013 - 2014)	.498 (.381-.650)	.500 (.400-.600)	1.00 (.800-1.40)	2.10 (1.60-4.30)	4.90 (2.20-10.8)	438
Non-Hispanic blacks (2013 - 2014)	.636 (.537-.754)	.600 (.500-.700)	1.40 (1.20-1.70)	3.20 (2.10-4.80)	6.00 (3.50-9.50)	608
Non-Hispanic whites (2013 - 2014)	.383 (.334-.440)	.400 (.300-.400)	.800 (.600-.900)	1.90 (1.40-2.40)	3.00 (2.40-4.00)	987
All Hispanics (2013 - 2014)	.507 (.424-.606)	.500 (.400-.600)	1.00 (.800-1.30)	2.10 (1.70-3.30)	4.10 (2.60-6.40)	690
Asians (2013 - 2014)	.327 (.270-.397)	.300 (.300-.300)	.600 (.500-.900)	1.40 (1.00-2.70)	2.80 (1.60-6.50)	287

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

Urinary Bisphenol S (creatinine corrected) (2013 – 2014)

CAS Number 80-05-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.428 (.387-.474)	.380 (.352-.411)	.797 (.690-.903)	1.80 (1.49-2.10)	3.33 (2.60-4.68)	2680
Age 6-11 years (2013 - 2014)	.444 (.390-.505)	.405 (.345-.457)	.778 (.652-.938)	1.59 (1.14-2.27)	2.63 (2.05-4.93)	409
Age 12-19 years (2013 - 2014)	.325 (.287-.368)	.294 (.256-.331)	.588 (.500-.674)	1.31 (.886-1.88)	2.27 (1.33-4.58)	461
Age 20+ years (2013 - 2014)	.444 (.396-.498)	.389 (.357-.426)	.839 (.714-.960)	1.88 (1.56-2.22)	3.49 (2.71-4.91)	1810
Males (2013 - 2014)	.383 (.335-.437)	.333 (.299-.370)	.741 (.630-.851)	1.56 (1.33-1.93)	2.81 (1.88-4.76)	1283
Females (2013 - 2014)	.477 (.431-.529)	.417 (.385-.455)	.848 (.729-.986)	2.03 (1.67-2.60)	3.64 (2.97-5.20)	1397
Mexican Americans (2013 - 2014)	.507 (.410-.627)	.458 (.370-.549)	.962 (.722-1.25)	2.22 (1.30-5.42)	5.57 (2.26-14.9)	438
Non-Hispanic blacks (2013 - 2014)	.471 (.398-.557)	.414 (.336-.519)	.943 (.792-1.11)	2.10 (1.50-3.67)	4.11 (2.58-6.69)	608
Non-Hispanic whites (2013 - 2014)	.402 (.354-.457)	.357 (.316-.390)	.714 (.596-.864)	1.68 (1.38-1.95)	3.02 (2.20-4.58)	986
All Hispanics (2013 - 2014)	.503 (.435-.581)	.487 (.411-.538)	.909 (.756-1.09)	2.03 (1.53-2.78)	3.90 (2.80-5.75)	690
Asians (2013 - 2014)	.420 (.359-.492)	.389 (.357-.459)	.720 (.546-.938)	1.68 (.964-2.76)	2.76 (1.75-8.04)	286

Urinary 4-tert-Octylphenol (2005 – 2010)‡

CAS Number 140-66-9

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	.200 (<LOD-.300)	2548
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	.300 (.200-.300)	2604
Total population (2009 - 2010)	*	< LOD	< LOD	.200 (<LOD-.300)	.300 (.300-.400)	2749
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	.300 (.200-.300)	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.200 (<LOD-.300)	.300 (.200-.400)	389
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.300 (<LOD-.400)	.400 (.300-.600)	415
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	.200 (<LOD-.400)	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.300 (<LOD-.400)	401
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	.300 (.200-.300)	.300 (.300-.400)	420
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	.200 (<LOD-.300)	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	.300 (.200-.400)	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	.300 (.200-.400)	1914
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	.200 (<LOD-.300)	1270
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	.300 (.200-.400)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.200 (<LOD-.300)	.300 (.300-.400)	1399
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1278
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	.300 (.200-.300)	1310
Females (2009 - 2010)	*	< LOD	< LOD	.200 (<LOD-.300)	.300 (.200-.400)	1350
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	.300 (<LOD-.800)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	.300 (.200-.300)	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	.300 (<LOD-.500)	566
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	.200 (<LOD-.400)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.200 (<LOD-.300)	.300 (.200-.500)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.300 (.200-.400)	.500 (.400-.600)	516
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	.200 (<LOD-.300)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	.200 (.200-.300)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.200 (<LOD-.300)	.300 (.300-.400)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.2, 0.2, and 0.2 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡The 2003-2004 data were removed due to potential for contamination that may have occurred during sampling. Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Octylphenol_BiomonitoringSummary.html

Urinary 4-tert-Octylphenol (creatinine corrected) (2005 – 2010)‡

CAS Number 140-66-9

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	.560 (<LOD-.620)	2548
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	.670 (.560-.880)	2604
Total population (2009 - 2010)	*	< LOD	< LOD	.470 (<LOD-.500)	.640 (.580-.680)	2749
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	.410 (.350-.610)	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.440 (<LOD-.540)	.600 (.420-.930)	389
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.560 (<LOD-.670)	.740 (.640-.830)	415
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	.450 (<LOD-.560)	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.420 (<LOD-.540)	401
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	.360 (.270-.440)	.450 (.340-.560)	420
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	.580 (<LOD-.670)	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	.700 (.580-.930)	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	.640 (.580-.700)	1914
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	.390 (<LOD-.440)	1270
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	.510 (.390-.600)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.380 (<LOD-.420)	.480 (.450-.610)	1399
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1278
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	.880 (.670-1.08)	1310
Females (2009 - 2010)	*	< LOD	< LOD	.540 (<LOD-.580)	.700 (.640-.880)	1350
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	.480 (<LOD-.740)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	.520 (.440-.610)	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	.560 (<LOD-.750)	566
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	.320 (<LOD-.400)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.320 (<LOD-.410)	.460 (.340-.610)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.300 (.250-.330)	.440 (.320-.560)	516
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	.610 (<LOD-.670)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	.700 (.560-.930)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.500 (<LOD-.560)	.670 (.580-.740)	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡The 2003-2004 data were removed due to potential for contamination that may have occurred during sampling. Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Octylphenol_BiomonitoringSummary.html

Urinary Triclocarban (2013 – 2014)

CAS Number 101-20-2

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	.200 (.200-.200)	2.20 (1.20-4.10)	13.4 (8.00-24.5)	2686
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	.300 (.200-.500)	.900 (.400-5.50)	409
Age 12-19 years (2013 - 2014)	*	< LOD	.200 (.100-.200)	.900 (.400-1.90)	2.60 (1.40-9.40)	462
Age 20+ years (2013 - 2014)	*	< LOD	.200 (.200-.300)	3.40 (1.80-7.00)	17.9 (10.0-30.8)	1815
Males (2013 - 2014)	*	< LOD	.200 (.200-.400)	3.50 (1.60-9.90)	31.9 (13.9-47.6)	1285
Females (2013 - 2014)	*	< LOD	.200 (.100-.200)	1.70 (.600-3.50)	7.50 (3.50-12.9)	1401
Mexican Americans (2013 - 2014)	*	< LOD	.100 (<LOD-.200)	.600 (.200-3.30)	3.30 (.400-16.3)	438
Non-Hispanic blacks (2013 - 2014)	.397 (.295-.536)	.200 (.100-.300)	1.10 (.700-2.00)	11.3 (6.00-17.9)	27.0 (11.7-67.9)	609
Non-Hispanic whites (2013 - 2014)	*	< LOD	.200 (.100-.200)	2.00 (.800-4.50)	14.8 (7.10-32.5)	988
All Hispanics (2013 - 2014)	*	< LOD	.100 (<LOD-.200)	.600 (.300-2.10)	4.40 (1.10-9.40)	690
Asians (2013 - 2014)	*	< LOD	.100 (<LOD-.100)	.500 (.200-1.40)	2.20 (.800-7.80)	289

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Triclocarban (creatinine corrected) (2013 – 2014)

CAS Number 101-20-2

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	.275 (.248-.306)	1.96 (1.00-4.17)	14.6 (8.93-21.3)	2684
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	.413 (.323-.725)	.778 (.389-7.77)	409
Age 12-19 years (2013 - 2014)	*	< LOD	.200 (.146-.248)	.559 (.380-.888)	1.97 (.769-8.70)	462
Age 20+ years (2013 - 2014)	*	< LOD	.292 (.261-.333)	3.20 (1.67-7.07)	17.6 (10.7-22.9)	1813
Males (2013 - 2014)	*	< LOD	.250 (.185-.306)	3.00 (1.07-9.86)	21.3 (13.7-28.3)	1284
Females (2013 - 2014)	*	< LOD	.292 (.250-.357)	1.65 (.700-4.17)	9.33 (4.17-14.9)	1400
Mexican Americans (2013 - 2014)	*	< LOD	.200 (<LOD-.292)	.559 (.292-1.35)	1.35 (.444-21.5)	438
Non-Hispanic blacks (2013 - 2014)	.293 (.220-.391)	.172 (.127-.235)	.741 (.513-1.11)	7.90 (2.41-19.3)	23.9 (10.8-28.9)	609
Non-Hispanic whites (2013 - 2014)	*	< LOD	.278 (.233-.333)	2.06 (.800-7.12)	15.4 (9.87-22.6)	987
All Hispanics (2013 - 2014)	*	< LOD	.192 (<LOD-.233)	.617 (.351-1.35)	4.48 (1.24-10.6)	690
Asians (2013 - 2014)	*	< LOD	.217 (<LOD-.250)	.625 (.379-1.67)	3.06 (.769-12.1)	288

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Triclosan (2003 – 2010)

CAS Number 3380-34-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	13.0 (11.6-14.6)	9.20 (7.90-10.9)	47.4 (38.2-58.4)	249 (188-304)	461 (383-522)	2517
Total population (2005 - 2006)	18.5 (16.1-21.3)	15.1 (11.8-18.5)	76.2 (57.9-97.6)	334 (279-402)	655 (573-739)	2548
Total population (2007 - 2008)	15.3 (13.5-17.4)	12.1 (10.2-13.8)	57.2 (46.1-65.9)	225 (176-288)	494 (371-615)	2604
Total population (2009 - 2010)	14.5 (12.6-16.6)	10.7 (8.80-12.6)	51.2 (39.4-67.7)	238 (200-284)	483 (398-569)	2749
Age 6-11 years (2003 - 2004)	8.16 (6.20-10.8)	6.00 (4.00-8.50)	20.7 (14.3-31.6)	123 (36.4-163)	157 (113-380)	314
Age 6-11 years (2005 - 2006)	12.8 (9.89-16.7)	10.3 (8.30-17.2)	35.4 (23.9-65.8)	97.6 (67.4-181)	246 (99.5-462)	356
Age 6-11 years (2007 - 2008)	11.8 (7.57-18.2)	9.80 (6.70-13.9)	27.7 (14.8-52.2)	98.5 (40.5-364)	296 (67.4-826)	389
Age 6-11 years (2009 - 2010)	10.9 (9.35-12.8)	9.90 (7.10-11.9)	28.3 (22.1-35.5)	95.5 (71.5-117)	200 (114-474)	415
Age 12-19 years (2003 - 2004)	14.5 (11.0-19.1)	10.3 (8.20-13.1)	39.0 (26.5-86.4)	304 (134-566)	655 (310-890)	715
Age 12-19 years (2005 - 2006)	18.8 (14.9-23.8)	15.4 (11.0-21.0)	67.5 (45.3-100)	330 (174-461)	566 (389-707)	702
Age 12-19 years (2007 - 2008)	18.2 (13.8-23.8)	13.8 (9.40-20.1)	63.2 (38.7-110)	296 (144-395)	401 (308-853)	401
Age 12-19 years (2009 - 2010)	11.7 (9.89-13.8)	8.80 (7.30-10.9)	30.2 (24.3-40.6)	165 (56.7-289)	301 (220-431)	420
Age 20+ years (2003 - 2004)	13.6 (12.0-15.3)	9.60 (8.20-11.5)	51.7 (39.6-65.7)	261 (198-317)	472 (406-522)	1488
Age 20+ years (2005 - 2006)	19.3 (16.4-22.6)	15.5 (11.8-19.4)	84.3 (61.0-114)	366 (289-462)	738 (583-864)	1490
Age 20+ years (2007 - 2008)	15.4 (13.7-17.3)	12.3 (10.1-14.4)	60.1 (48.5-69.0)	225 (185-286)	504 (378-573)	1814
Age 20+ years (2009 - 2010)	15.5 (12.9-18.5)	11.1 (8.60-14.2)	61.8 (41.8-86.0)	262 (214-327)	544 (415-621)	1914
Males (2003 - 2004)	16.2 (13.4-19.6)	11.7 (9.30-14.8)	84.9 (50.6-111)	317 (231-433)	574 (461-716)	1229
Males (2005 - 2006)	21.3 (17.6-25.7)	17.6 (11.9-23.2)	103 (69.9-143)	446 (366-488)	738 (601-873)	1270
Males (2007 - 2008)	15.2 (12.9-17.9)	12.3 (9.50-15.3)	60.6 (45.8-72.8)	236 (159-338)	467 (367-636)	1294
Males (2009 - 2010)	14.8 (12.7-17.4)	10.9 (8.60-13.3)	55.1 (40.4-77.5)	243 (214-295)	455 (327-600)	1399
Females (2003 - 2004)	10.6 (9.29-12.1)	7.60 (6.10-9.10)	33.2 (27.1-39.4)	144 (96.5-250)	380 (258-430)	1288
Females (2005 - 2006)	16.2 (13.9-18.8)	12.6 (10.1-15.6)	58.7 (41.5-81.9)	226 (169-304)	513 (310-773)	1278
Females (2007 - 2008)	15.5 (12.6-18.9)	12.0 (9.90-14.1)	52.1 (37.1-74.4)	210 (133-367)	504 (285-648)	1310
Females (2009 - 2010)	14.2 (12.0-16.8)	10.5 (8.70-12.6)	50.0 (34.4-63.8)	235 (149-302)	488 (332-661)	1350
Mexican Americans (2003 - 2004)	14.6 (10.6-20.1)	8.80 (5.40-17.5)	65.4 (32.8-127)	357 (225-456)	597 (372-992)	613
Mexican Americans (2005 - 2006)	26.7 (21.2-33.7)	18.7 (13.5-25.5)	196 (99.4-269)	668 (475-759)	866 (750-1180)	637
Mexican Americans (2007 - 2008)	17.1 (12.9-22.6)	11.8 (8.40-17.8)	67.4 (42.5-106)	358 (208-474)	556 (363-856)	531
Mexican Americans (2009 - 2010)	14.9 (12.2-18.3)	10.2 (8.20-12.8)	54.7 (33.3-86.5)	345 (260-494)	691 (443-1180)	566
Non-Hispanic blacks (2003 - 2004)	14.4 (11.4-18.2)	11.1 (8.70-16.1)	37.6 (30.2-58.0)	203 (87.5-341)	450 (254-750)	652
Non-Hispanic blacks (2005 - 2006)	17.3 (13.3-22.4)	14.0 (10.4-19.0)	59.2 (37.7-98.3)	258 (138-460)	541 (273-1190)	678
Non-Hispanic blacks (2007 - 2008)	13.7 (11.7-16.1)	11.3 (8.80-13.9)	41.4 (28.9-49.6)	150 (93.5-265)	480 (190-757)	597
Non-Hispanic blacks (2009 - 2010)	12.8 (10.8-15.0)	9.30 (7.70-11.7)	34.3 (24.0-44.6)	168 (88.4-263)	451 (202-959)	516
Non-Hispanic whites (2003 - 2004)	12.9 (11.2-14.9)	9.20 (7.40-11.0)	49.2 (37.8-63.4)	245 (163-334)	461 (383-527)	1092
Non-Hispanic whites (2005 - 2006)	17.5 (14.9-20.6)	15.1 (10.9-19.0)	74.3 (54.1-90.3)	288 (231-366)	569 (462-693)	1038
Non-Hispanic whites (2007 - 2008)	15.0 (12.6-17.7)	12.3 (9.80-14.5)	59.6 (41.9-73.4)	197 (147-266)	408 (296-537)	1077
Non-Hispanic whites (2009 - 2010)	14.0 (11.8-16.7)	10.5 (8.30-12.9)	51.7 (33.1-79.2)	216 (174-266)	431 (301-565)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 2.3, 2.3, 2.3, and 2.3 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Triclosan_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Triclosan_FactSheet.html

Urinary Triclosan (2011 – 2014)

CAS Number 3380-34-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	11.8 (10.6-13.1)	7.10 (6.10-7.90)	41.6 (30.2-59.5)	267 (207-332)	553 (429-722)	2489
Total population (2013 - 2014)	9.78 (9.01-10.6)	6.30 (5.70-7.20)	33.9 (29.1-39.1)	172 (138-208)	379 (324-431)	2686
Age 6-11 years (2011 - 2012)	7.18 (5.73-9.01)	5.00 (3.40-7.30)	17.2 (10.4-21.8)	77.6 (28.9-184)	184 (78.7-393)	396
Age 6-11 years (2013 - 2014)	8.24 (6.70-10.1)	6.10 (4.80-8.00)	22.9 (15.3-33.5)	73.8 (52.7-96.0)	124 (91.2-204)	409
Age 12-19 years (2011 - 2012)	10.1 (7.70-13.3)	5.80 (4.70-7.50)	25.5 (15.1-38.9)	156 (73.5-286)	489 (171-1550)	388
Age 12-19 years (2013 - 2014)	7.96 (6.81-9.31)	6.00 (4.80-7.40)	19.7 (15.4-25.3)	85.7 (37.2-183)	224 (122-325)	462
Age 20+ years (2011 - 2012)	12.7 (11.2-14.4)	7.60 (6.40-8.50)	57.4 (37.0-75.8)	298 (243-388)	594 (437-845)	1705
Age 20+ years (2013 - 2014)	10.3 (9.32-11.3)	6.40 (5.60-7.50)	39.3 (32.4-48.5)	203 (147-270)	420 (350-529)	1815
Males (2011 - 2012)	11.6 (10.1-13.1)	6.40 (5.30-7.50)	41.6 (28.1-58.7)	320 (211-388)	566 (392-722)	1259
Males (2013 - 2014)	9.95 (8.75-11.3)	6.40 (5.20-8.50)	34.7 (29.3-40.6)	172 (126-215)	372 (297-479)	1285
Females (2011 - 2012)	12.0 (10.2-14.0)	7.60 (6.20-8.60)	42.2 (25.7-75.8)	242 (188-286)	545 (380-855)	1230
Females (2013 - 2014)	9.63 (8.41-11.0)	6.20 (5.60-7.10)	31.7 (24.9-42.5)	173 (112-240)	384 (302-528)	1401
Mexican Americans (2011 - 2012)	12.6 (8.98-17.8)	7.20 (4.70-11.7)	47.6 (21.9-82.7)	411 (151-628)	628 (393-1250)	316
Mexican Americans (2013 - 2014)	8.65 (5.55-13.5)	5.20 (2.60-12.2)	31.9 (15.4-68.0)	191 (79.5-346)	488 (180-822)	438
Non-Hispanic blacks (2011 - 2012)	10.5 (9.08-12.2)	6.70 (5.70-8.40)	29.9 (22.4-40.0)	169 (106-278)	475 (278-718)	665
Non-Hispanic blacks (2013 - 2014)	8.34 (7.54-9.23)	5.50 (4.40-6.60)	24.9 (18.9-32.6)	145 (68.6-209)	304 (204-509)	609
Non-Hispanic whites (2011 - 2012)	11.7 (10.0-13.7)	7.00 (5.60-8.00)	44.6 (24.4-75.8)	248 (184-392)	552 (365-759)	813
Non-Hispanic whites (2013 - 2014)	10.0 (8.95-11.3)	6.40 (5.60-8.00)	34.7 (29.2-43.1)	148 (122-210)	350 (253-438)	988
All Hispanics (2011 - 2012)	13.4 (11.6-15.5)	7.50 (6.40-9.30)	48.3 (33.2-75.5)	411 (264-518)	861 (536-1040)	571
All Hispanics (2013 - 2014)	9.14 (6.95-12.0)	6.00 (3.70-9.50)	29.6 (17.9-44.3)	208 (131-325)	583 (325-737)	690
Asians (2011 - 2012)	11.7 (7.75-17.8)	7.30 (3.80-15.1)	42.9 (18.6-125)	274 (117-433)	453 (235-636)	352
Asians (2013 - 2014)	11.5 (9.24-14.3)	6.20 (4.30-9.10)	71.5 (25.2-121)	294 (212-428)	594 (384-740)	289

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 13-14 are 2.3 and 1.7, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Triclosan_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Triclosan_FactSheet.html

Urinary Triclosan (creatinine corrected) (2003 – 2010)

CAS Number 3380-34-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	12.7 (11.5-14.1)	9.48 (8.22-10.4)	43.9 (33.8-60.6)	212 (172-241)	368 (294-463)	2514
Total population (2005 - 2006)	18.0 (16.0-20.3)	13.0 (11.5-16.1)	73.2 (57.3-91.6)	304 (240-364)	532 (434-674)	2548
Total population (2007 - 2008)	15.5 (13.7-17.5)	12.4 (10.6-14.2)	50.4 (40.2-59.8)	233 (171-300)	443 (330-559)	2604
Total population (2009 - 2010)	15.1 (13.2-17.4)	10.9 (9.41-12.4)	49.4 (37.0-67.3)	256 (191-322)	454 (352-557)	2749
Age 6-11 years (2003 - 2004)	9.93 (7.43-13.3)	7.55 (4.72-13.4)	25.1 (15.3-35.6)	116 (39.9-236)	236 (115-336)	314
Age 6-11 years (2005 - 2006)	14.1 (10.8-18.5)	13.5 (7.97-18.5)	38.6 (26.0-54.1)	108 (62.4-169)	241 (108-598)	356
Age 6-11 years (2007 - 2008)	14.5 (9.47-22.1)	13.0 (8.00-17.5)	33.1 (17.5-72.4)	132 (52.7-331)	331 (131-599)	389
Age 6-11 years (2009 - 2010)	14.2 (12.4-16.4)	12.0 (8.84-15.0)	37.1 (27.0-47.3)	129 (89.1-155)	300 (148-469)	415
Age 12-19 years (2003 - 2004)	10.9 (8.32-14.2)	7.45 (5.48-10.7)	31.8 (21.9-61.1)	193 (90.7-318)	356 (169-580)	713
Age 12-19 years (2005 - 2006)	14.0 (11.0-17.8)	11.1 (8.68-13.6)	51.0 (33.0-73.4)	193 (125-306)	385 (203-739)	702
Age 12-19 years (2007 - 2008)	14.1 (11.0-18.1)	11.0 (7.87-14.4)	50.2 (27.1-78.8)	206 (95.3-293)	378 (238-571)	401
Age 12-19 years (2009 - 2010)	9.38 (7.86-11.2)	7.71 (5.71-9.21)	23.2 (17.3-29.3)	153 (63.0-201)	247 (166-379)	420
Age 20+ years (2003 - 2004)	13.4 (12.0-15.1)	10.0 (8.89-11.4)	50.0 (36.0-73.8)	224 (186-272)	385 (308-506)	1487
Age 20+ years (2005 - 2006)	19.3 (16.9-22.0)	13.7 (11.6-17.0)	86.1 (64.0-109)	343 (262-411)	581 (440-718)	1490
Age 20+ years (2007 - 2008)	15.8 (14.0-17.8)	12.6 (10.7-14.5)	52.3 (43.8-64.6)	244 (186-309)	484 (336-568)	1814
Age 20+ years (2009 - 2010)	16.4 (13.7-19.6)	11.5 (9.63-14.8)	57.1 (38.4-80.2)	279 (202-364)	504 (372-601)	1914
Males (2003 - 2004)	13.2 (11.3-15.6)	9.21 (6.86-12.1)	73.1 (45.8-85.9)	237 (175-294)	384 (294-506)	1228
Males (2005 - 2006)	17.1 (14.1-20.7)	12.4 (10.0-18.5)	82.6 (58.2-109)	308 (232-368)	472 (355-721)	1270
Males (2007 - 2008)	12.8 (10.9-15.0)	10.0 (8.12-13.0)	45.7 (32.1-57.3)	191 (132-241)	330 (253-456)	1294
Males (2009 - 2010)	13.3 (11.3-15.7)	9.21 (7.40-11.7)	43.9 (33.5-67.4)	230 (178-276)	345 (276-429)	1399
Females (2003 - 2004)	12.2 (10.6-14.2)	9.54 (8.45-10.4)	32.3 (26.2-46.6)	182 (138-217)	336 (225-480)	1286
Females (2005 - 2006)	19.0 (16.1-22.6)	13.8 (11.7-16.7)	64.0 (47.6-89.8)	301 (209-434)	619 (418-898)	1278
Females (2007 - 2008)	18.5 (15.6-22.0)	14.4 (12.4-16.8)	55.3 (38.5-77.0)	300 (182-435)	571 (359-729)	1310
Females (2009 - 2010)	17.1 (14.6-20.1)	12.3 (10.7-14.8)	50.6 (37.0-71.3)	300 (187-422)	556 (422-668)	1350
Mexican Americans (2003 - 2004)	13.3 (9.38-18.8)	9.18 (5.45-13.9)	66.7 (28.8-112)	292 (151-432)	453 (263-1150)	612
Mexican Americans (2005 - 2006)	24.1 (19.3-29.9)	17.6 (13.3-22.8)	154 (96.4-242)	440 (379-601)	736 (601-818)	637
Mexican Americans (2007 - 2008)	16.6 (12.2-22.6)	12.6 (8.51-16.5)	60.1 (39.6-80.3)	325 (182-475)	637 (368-828)	531
Mexican Americans (2009 - 2010)	14.8 (12.1-18.2)	9.38 (7.63-12.4)	45.4 (32.2-110)	352 (244-458)	578 (402-737)	566
Non-Hispanic blacks (2003 - 2004)	9.94 (7.92-12.5)	7.74 (5.50-10.0)	30.2 (25.6-37.3)	132 (78.0-213)	260 (127-513)	651
Non-Hispanic blacks (2005 - 2006)	12.2 (9.47-15.6)	9.50 (7.64-11.8)	41.0 (23.3-77.4)	179 (106-243)	352 (203-674)	678
Non-Hispanic blacks (2007 - 2008)	10.6 (8.91-12.7)	8.34 (6.47-10.1)	28.6 (22.3-36.7)	120 (71.0-203)	266 (151-407)	597
Non-Hispanic blacks (2009 - 2010)	9.23 (7.62-11.2)	6.62 (5.63-8.18)	22.7 (16.9-29.1)	136 (63.6-240)	356 (180-689)	516
Non-Hispanic whites (2003 - 2004)	13.3 (11.6-15.1)	9.82 (8.11-11.5)	47.0 (34.3-67.7)	213 (160-272)	358 (276-480)	1091
Non-Hispanic whites (2005 - 2006)	18.4 (16.0-21.2)	13.5 (11.6-17.0)	73.4 (56.8-97.0)	282 (231-343)	472 (367-699)	1038
Non-Hispanic whites (2007 - 2008)	15.6 (13.1-18.7)	13.0 (10.7-14.8)	50.4 (35.9-65.9)	222 (129-303)	418 (262-586)	1077
Non-Hispanic whites (2009 - 2010)	15.8 (13.1-19.0)	11.4 (9.41-14.8)	52.0 (37.0-71.3)	242 (159-323)	410 (317-547)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Triclosan_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Triclosan_FactSheet.html

Urinary Triclosan (creatinine corrected) (2011 – 2014)

CAS Number 3380-34-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	13.4 (11.8-15.1)	8.39 (6.79-10.0)	49.3 (37.4-57.5)	309 (229-404)	642 (508-788)	2487
Total population (2013 - 2014)	9.83 (9.00-10.7)	6.90 (6.27-7.65)	29.9 (25.1-34.4)	173 (138-207)	358 (292-425)	2684
Age 6-11 years (2011 - 2012)	10.3 (8.18-12.9)	6.70 (5.62-9.06)	22.4 (16.3-31.7)	103 (54.5-153)	235 (113-333)	395
Age 6-11 years (2013 - 2014)	10.4 (8.61-12.6)	8.97 (6.62-11.5)	23.4 (18.4-36.1)	78.1 (57.0-125)	184 (81.2-268)	409
Age 12-19 years (2011 - 2012)	9.84 (7.85-12.4)	5.83 (4.95-7.23)	26.3 (19.0-37.8)	182 (65.0-399)	421 (182-647)	388
Age 12-19 years (2013 - 2014)	6.46 (5.24-7.96)	5.11 (4.39-5.93)	15.7 (10.0-21.8)	53.6 (33.2-105)	153 (102-289)	462
Age 20+ years (2011 - 2012)	14.4 (12.4-16.7)	9.06 (7.41-11.2)	54.3 (43.9-75.0)	364 (246-514)	660 (536-817)	1704
Age 20+ years (2013 - 2014)	10.4 (9.44-11.4)	7.17 (6.32-8.26)	34.4 (29.3-41.6)	202 (162-234)	408 (296-531)	1813
Males (2011 - 2012)	10.8 (9.49-12.2)	6.40 (5.24-8.53)	37.4 (26.8-49.4)	226 (153-309)	536 (311-656)	1258
Males (2013 - 2014)	8.36 (7.44-9.41)	5.74 (4.80-6.67)	26.7 (22.6-31.8)	143 (111-195)	296 (216-426)	1284
Females (2011 - 2012)	16.5 (13.8-19.6)	10.8 (8.44-12.7)	53.3 (44.2-75.0)	381 (273-539)	746 (614-900)	1229
Females (2013 - 2014)	11.5 (10.0-13.1)	8.08 (6.70-9.23)	34.4 (25.1-42.2)	205 (150-253)	419 (294-573)	1400
Mexican Americans (2011 - 2012)	14.2 (10.4-19.5)	8.29 (6.10-12.4)	62.5 (31.8-111)	399 (163-536)	536 (271-900)	316
Mexican Americans (2013 - 2014)	8.82 (5.50-14.1)	6.08 (3.08-13.4)	25.5 (15.9-61.3)	147 (68.8-340)	425 (142-659)	438
Non-Hispanic blacks (2011 - 2012)	8.18 (7.09-9.44)	5.52 (4.66-6.27)	21.5 (16.7-29.9)	130 (74.3-222)	365 (229-461)	665
Non-Hispanic blacks (2013 - 2014)	6.16 (5.30-7.15)	4.27 (3.52-4.93)	16.7 (12.7-21.3)	107 (66.1-125)	218 (116-284)	609
Non-Hispanic whites (2011 - 2012)	14.2 (12.1-16.7)	8.95 (6.79-11.7)	51.9 (39.1-69.1)	311 (180-569)	675 (508-817)	811
Non-Hispanic whites (2013 - 2014)	10.6 (9.78-11.5)	7.78 (6.67-9.09)	33.0 (26.4-40.2)	178 (128-215)	339 (247-420)	987
All Hispanics (2011 - 2012)	15.0 (13.0-17.3)	8.58 (6.52-11.4)	70.8 (40.8-98.6)	449 (320-514)	647 (506-913)	571
All Hispanics (2013 - 2014)	9.07 (6.64-12.4)	6.08 (3.75-11.0)	24.7 (17.0-55.6)	197 (114-322)	462 (322-619)	690
Asians (2011 - 2012)	15.7 (10.2-24.2)	10.5 (6.05-17.4)	51.8 (23.6-142)	333 (127-609)	575 (381-719)	352
Asians (2013 - 2014)	14.6 (11.5-18.6)	8.00 (5.74-13.3)	100 (39.3-151)	406 (247-528)	659 (419-917)	288

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Triclosan_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Triclosan_FactSheet.html

Urinary Butyl paraben (2005 – 2010)

CAS Number 94-26-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	1.30 (.800-1.80)	6.60 (4.80-10.7)	19.6 (16.4-26.7)	2548
Total population (2007 - 2008)	*	< LOD	1.10 (.900-1.50)	9.00 (6.20-11.4)	20.9 (15.2-30.1)	2604
Total population (2009 - 2010)	*	< LOD	.600 (.500-.800)	5.10 (3.40-8.10)	17.1 (10.5-29.4)	2749
Age 6-11 years (2005 - 2006)	*	< LOD	.400 (.200-.600)	1.90 (.800-5.80)	7.50 (1.70-18.5)	356
Age 6-11 years (2007 - 2008)	*	< LOD	.300 (.200-.500)	1.30 (.900-1.70)	3.80 (1.00-11.4)	389
Age 6-11 years (2009 - 2010)	*	< LOD	.300 (<LOD-.400)	.900 (.500-1.70)	2.20 (1.30-5.10)	415
Age 12-19 years (2005 - 2006)	*	.200 (<LOD-.400)	.900 (.600-1.80)	9.60 (4.10-16.1)	24.6 (14.5-33.4)	702
Age 12-19 years (2007 - 2008)	*	< LOD	.800 (.600-1.40)	6.20 (2.50-11.5)	15.8 (6.20-33.2)	401
Age 12-19 years (2009 - 2010)	*	< LOD	.500 (.400-.900)	5.70 (1.40-15.7)	18.6 (5.70-39.0)	420
Age 20+ years (2005 - 2006)	*	< LOD	1.70 (1.00-2.20)	6.80 (4.80-11.7)	20.5 (15.8-28.3)	1490
Age 20+ years (2007 - 2008)	*	< LOD	1.50 (1.00-1.90)	9.80 (6.70-13.4)	24.6 (16.5-32.0)	1814
Age 20+ years (2009 - 2010)	*	< LOD	.700 (.500-1.00)	6.00 (3.70-10.0)	18.7 (11.9-35.1)	1914
Males (2005 - 2006)	*	< LOD	.300 (<LOD-.300)	1.10 (.600-2.00)	3.20 (1.90-5.50)	1270
Males (2007 - 2008)	*	< LOD	.200 (.200-.300)	1.00 (.700-1.50)	3.60 (2.00-7.20)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.800 (.500-1.20)	2.70 (1.50-12.0)	1399
Females (2005 - 2006)	.904 (.760-1.07)	.500 (.400-.700)	3.70 (2.90-4.80)	17.4 (11.7-20.8)	34.9 (28.2-41.1)	1278
Females (2007 - 2008)	.926 (.825-1.04)	.500 (.400-.700)	3.90 (3.00-4.70)	17.9 (12.1-20.5)	34.8 (25.2-52.1)	1310
Females (2009 - 2010)	*	.300 (.200-.400)	1.80 (1.30-2.30)	11.3 (6.60-18.8)	31.8 (17.7-49.4)	1350
Mexican Americans (2005 - 2006)	*	.200 (<LOD-.300)	1.10 (.700-2.30)	11.3 (6.40-15.6)	27.3 (16.5-35.9)	637
Mexican Americans (2007 - 2008)	*	< LOD	.900 (.500-1.30)	6.80 (3.50-13.2)	22.7 (13.2-30.7)	531
Mexican Americans (2009 - 2010)	*	< LOD	.900 (.400-1.30)	8.30 (4.50-13.8)	18.8 (13.8-35.1)	566
Non-Hispanic blacks (2005 - 2006)	*	.300 (.200-.400)	2.10 (1.00-3.50)	9.10 (4.40-25.0)	31.8 (10.1-82.6)	678
Non-Hispanic blacks (2007 - 2008)	*	.200 (<LOD-.300)	1.10 (.700-1.70)	7.10 (4.20-9.90)	20.0 (8.90-31.3)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.500 (.300-.900)	3.10 (1.40-7.30)	9.00 (5.60-16.7)	516
Non-Hispanic whites (2005 - 2006)	*	< LOD	1.00 (.700-1.80)	5.80 (4.00-9.00)	17.7 (11.7-25.9)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	1.20 (.800-1.60)	9.10 (5.00-13.3)	19.6 (12.1-32.0)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	.700 (.500-.900)	4.90 (2.70-9.20)	17.7 (9.20-34.5)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.2, 0.2, and 0.2 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Butyl paraben (2011 – 2014)

CAS Number 94-26-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	.300 (.200-.400)	2.50 (1.60-3.40)	7.70 (4.50-11.4)	2489
Total population (2013 - 2014)	*	< LOD	.200 (.100-.200)	1.30 (.800-1.70)	4.40 (2.70-6.10)	2686
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	.700 (.300-1.00)	1.50 (1.00-1.90)	396
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	.300 (.200-.500)	.600 (.300-1.30)	409
Age 12-19 years (2011 - 2012)	*	< LOD	.300 (<LOD-.400)	.900 (.500-1.60)	1.90 (1.10-7.10)	388
Age 12-19 years (2013 - 2014)	*	< LOD	.200 (.100-.200)	1.20 (.500-1.90)	5.90 (1.70-26.7)	462
Age 20+ years (2011 - 2012)	*	< LOD	.400 (.300-.500)	3.30 (2.20-5.50)	8.90 (5.50-13.9)	1705
Age 20+ years (2013 - 2014)	*	< LOD	.200 (.100-.300)	1.50 (.900-2.20)	4.90 (2.70-7.40)	1815
Males (2011 - 2012)	*	< LOD	< LOD	.400 (.200-.500)	1.30 (.500-2.40)	1259
Males (2013 - 2014)	*	< LOD	< LOD	.200 (.100-.200)	.400 (.300-.700)	1285
Females (2011 - 2012)	*	< LOD	.900 (.600-1.40)	5.90 (3.40-10.4)	13.4 (9.30-24.5)	1230
Females (2013 - 2014)	*	< LOD	.500 (.400-.800)	2.90 (1.90-4.90)	8.40 (4.90-15.3)	1401
Mexican Americans (2011 - 2012)	*	< LOD	.300 (<LOD-.400)	1.80 (1.40-5.90)	10.0 (3.20-13.7)	316
Mexican Americans (2013 - 2014)	*	< LOD	.200 (.100-.300)	1.60 (.500-4.40)	7.10 (2.10-21.2)	438
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.200 (<LOD-.300)	1.60 (1.00-2.50)	4.70 (2.50-8.10)	665
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.100 (<LOD-.200)	.800 (.500-1.70)	3.20 (1.70-5.50)	609
Non-Hispanic whites (2011 - 2012)	*	< LOD	.300 (.200-.500)	2.60 (1.50-4.60)	8.00 (4.10-13.0)	813
Non-Hispanic whites (2013 - 2014)	*	< LOD	.200 (.100-.200)	1.20 (.700-1.70)	3.20 (1.80-5.60)	988
All Hispanics (2011 - 2012)	*	< LOD	.300 (<LOD-.400)	2.60 (1.30-7.00)	10.2 (3.40-21.5)	571
All Hispanics (2013 - 2014)	*	< LOD	.200 (.100-.300)	1.90 (.700-4.30)	9.00 (3.20-20.7)	690
Asians (2011 - 2012)	*	< LOD	.400 (<LOD-1.10)	3.10 (1.40-7.70)	12.0 (4.80-20.5)	352
Asians (2013 - 2014)	*	< LOD	.200 (<LOD-.500)	2.90 (1.10-10.0)	18.4 (5.60-26.1)	289

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 13-14 are 0.2 and 0.1, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Butyl paraben (creatinine corrected) (2005 – 2010)

CAS Number 94-26-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	1.16 (.910-1.62)	7.82 (6.26-11.2)	21.2 (16.8-27.3)	2548
Total population (2007 - 2008)	*	< LOD	1.16 (.880-1.59)	9.83 (6.51-13.5)	23.1 (18.1-30.4)	2604
Total population (2009 - 2010)	*	< LOD	.710 (.610-.930)	5.58 (3.55-10.0)	18.0 (10.2-27.6)	2749
Age 6-11 years (2005 - 2006)	*	< LOD	.440 (.370-.660)	1.65 (1.00-5.29)	7.92 (1.64-30.5)	356
Age 6-11 years (2007 - 2008)	*	< LOD	.540 (.410-.720)	1.24 (.920-2.80)	5.91 (.930-76.0)	389
Age 6-11 years (2009 - 2010)	*	< LOD	.530 (<LOD-.630)	1.36 (.740-1.89)	2.74 (1.56-6.58)	415
Age 12-19 years (2005 - 2006)	*	.190 (<LOD-.250)	.690 (.490-1.20)	6.67 (3.60-11.2)	18.7 (9.52-28.9)	702
Age 12-19 years (2007 - 2008)	*	< LOD	.670 (.450-.930)	3.70 (1.80-7.41)	9.64 (6.00-18.7)	401
Age 12-19 years (2009 - 2010)	*	< LOD	.550 (.420-.790)	3.75 (1.21-11.9)	13.8 (3.75-23.7)	420
Age 20+ years (2005 - 2006)	*	< LOD	1.49 (1.06-1.96)	9.07 (6.55-14.8)	25.5 (17.9-30.4)	1490
Age 20+ years (2007 - 2008)	*	< LOD	1.52 (1.04-2.21)	12.4 (8.35-15.1)	27.5 (21.2-36.8)	1814
Age 20+ years (2009 - 2010)	*	< LOD	.830 (.640-1.19)	7.06 (3.79-11.9)	22.0 (13.1-31.2)	1914
Males (2005 - 2006)	*	< LOD	.290 (<LOD-.350)	.830 (.570-1.16)	2.28 (1.43-2.91)	1270
Males (2007 - 2008)	*	< LOD	.290 (.260-.340)	.830 (.620-1.36)	2.40 (1.56-4.85)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.700 (.560-1.09)	2.50 (1.18-5.87)	1399
Females (2005 - 2006)	1.06 (.914-1.24)	.750 (.600-.860)	4.44 (3.01-6.26)	19.8 (13.5-25.7)	34.7 (26.9-42.7)	1278
Females (2007 - 2008)	1.11 (.984-1.25)	.670 (.550-.920)	4.44 (3.02-6.12)	20.6 (14.6-25.9)	39.4 (28.1-77.7)	1310
Females (2009 - 2010)	*	.450 (.420-.520)	2.17 (1.67-3.10)	13.5 (8.75-22.5)	28.2 (18.4-45.7)	1350
Mexican Americans (2005 - 2006)	*	.240 (<LOD-.290)	1.20 (.760-1.68)	9.15 (5.36-15.2)	20.3 (15.8-29.2)	637
Mexican Americans (2007 - 2008)	*	< LOD	.810 (.610-1.07)	8.57 (3.28-12.0)	23.0 (12.7-29.5)	531
Mexican Americans (2009 - 2010)	*	< LOD	.930 (.570-1.76)	8.01 (4.77-10.5)	17.0 (10.5-27.1)	566
Non-Hispanic blacks (2005 - 2006)	*	.220 (.180-.270)	1.46 (.750-2.64)	8.18 (3.65-17.9)	21.0 (10.9-51.3)	678
Non-Hispanic blacks (2007 - 2008)	*	.220 (<LOD-.280)	.900 (.570-1.27)	5.21 (3.13-6.18)	12.1 (6.14-21.4)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.390 (.270-.590)	2.63 (.890-4.71)	7.00 (3.26-11.9)	516
Non-Hispanic whites (2005 - 2006)	*	< LOD	1.12 (.850-1.65)	6.93 (5.21-9.91)	20.9 (15.4-27.3)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	1.18 (.810-2.09)	10.7 (6.32-14.8)	26.8 (15.1-40.4)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	.780 (.620-1.13)	6.34 (3.44-12.6)	20.8 (9.12-33.2)	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Butyl paraben (creatinine corrected) (2011 – 2014)

CAS Number 94-26-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	.560 (.476-.667)	3.50 (2.00-4.55)	10.0 (6.26-13.5)	2487
Total population (2013 - 2014)	*	< LOD	.250 (.202-.318)	1.54 (.952-2.22)	4.39 (3.25-6.96)	2684
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	.825 (.737-1.12)	1.56 (.825-2.44)	395
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	.411 (.326-.538)	.714 (.467-.984)	409
Age 12-19 years (2011 - 2012)	*	< LOD	.378 (<LOD-.588)	1.35 (.588-2.21)	2.21 (1.50-7.45)	388
Age 12-19 years (2013 - 2014)	*	< LOD	.194 (.159-.233)	1.02 (.484-1.88)	4.00 (1.74-12.1)	462
Age 20+ years (2011 - 2012)	*	< LOD	.609 (.500-.789)	4.02 (2.58-6.28)	12.2 (7.04-17.9)	1704
Age 20+ years (2013 - 2014)	*	< LOD	.269 (.208-.382)	1.74 (1.15-2.63)	5.42 (3.42-8.95)	1813
Males (2011 - 2012)	*	< LOD	< LOD	.583 (.424-.824)	1.35 (.778-2.25)	1258
Males (2013 - 2014)	*	< LOD	< LOD	.225 (.179-.280)	.417 (.304-.583)	1284
Females (2011 - 2012)	*	< LOD	1.56 (1.08-2.00)	8.19 (5.33-12.1)	17.6 (11.8-30.8)	1229
Females (2013 - 2014)	*	< LOD	.690 (.411-1.11)	3.42 (2.41-4.87)	10.2 (6.22-13.4)	1400
Mexican Americans (2011 - 2012)	*	< LOD	.533 (<LOD-.660)	3.48 (1.30-4.33)	7.45 (3.50-19.2)	316
Mexican Americans (2013 - 2014)	*	< LOD	.247 (.189-.350)	1.71 (.811-5.00)	10.6 (1.87-25.4)	438
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.298 (<LOD-.378)	1.43 (.875-1.93)	3.47 (1.93-6.72)	665
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.146 (<LOD-.189)	.583 (.368-1.16)	2.86 (1.19-3.25)	609
Non-Hispanic whites (2011 - 2012)	*	< LOD	.606 (.500-.778)	3.78 (2.08-5.63)	11.5 (5.39-15.7)	811
Non-Hispanic whites (2013 - 2014)	*	< LOD	.259 (.200-.368)	1.54 (.778-2.33)	4.03 (2.50-6.09)	987
All Hispanics (2011 - 2012)	*	< LOD	.526 (<LOD-.700)	3.50 (1.53-6.88)	13.7 (6.54-19.2)	571
All Hispanics (2013 - 2014)	*	< LOD	.250 (.219-.309)	1.73 (.896-3.92)	10.3 (3.56-14.3)	690
Asians (2011 - 2012)	*	< LOD	.824 (<LOD-1.30)	6.28 (2.03-12.3)	14.9 (7.89-18.8)	352
Asians (2013 - 2014)	*	< LOD	.440 (<LOD-.606)	3.46 (1.43-13.0)	23.6 (5.45-38.4)	288

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Ethyl paraben (2005 – 2010)

CAS Number 120-47-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	4.80 (3.40-6.00)	26.2 (19.4-31.9)	57.2 (40.3-83.4)	2548
Total population (2007 - 2008)	*	< LOD	5.40 (3.80-6.90)	29.3 (21.9-42.4)	72.1 (54.6-91.8)	2604
Total population (2009 - 2010)	*	1.10 (<LOD-1.20)	6.60 (4.90-8.30)	37.6 (24.4-51.3)	82.6 (60.3-119)	2749
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	2.60 (1.70-4.70)	9.90 (2.80-30.7)	356
Age 6-11 years (2007 - 2008)	*	< LOD	1.70 (1.10-2.60)	4.60 (2.30-36.7)	35.6 (2.60-282)	389
Age 6-11 years (2009 - 2010)	*	< LOD	1.50 (1.20-1.80)	3.70 (2.50-5.30)	11.5 (4.50-18.4)	415
Age 12-19 years (2005 - 2006)	*	< LOD	2.30 (1.30-3.20)	11.3 (7.90-24.1)	38.0 (17.7-122)	702
Age 12-19 years (2007 - 2008)	*	< LOD	3.00 (2.30-4.90)	23.0 (7.30-60.3)	60.3 (12.5-159)	401
Age 12-19 years (2009 - 2010)	*	< LOD	3.50 (2.10-5.90)	33.8 (19.4-49.6)	83.2 (34.5-284)	420
Age 20+ years (2005 - 2006)	*	< LOD	5.90 (4.60-8.10)	30.4 (22.3-38.6)	69.5 (48.1-89.5)	1490
Age 20+ years (2007 - 2008)	*	1.10 (<LOD-1.40)	6.20 (4.60-9.20)	34.7 (22.8-50.4)	77.4 (51.4-120)	1814
Age 20+ years (2009 - 2010)	*	1.30 (1.10-1.50)	8.40 (6.00-10.6)	45.0 (29.1-60.3)	91.4 (62.6-129)	1914
Males (2005 - 2006)	*	< LOD	1.90 (1.20-3.00)	8.90 (5.80-13.7)	25.2 (15.7-29.2)	1270
Males (2007 - 2008)	*	< LOD	2.40 (1.50-3.00)	11.2 (6.60-15.3)	28.3 (15.3-42.8)	1294
Males (2009 - 2010)	*	< LOD	2.20 (1.90-2.70)	10.4 (7.40-19.1)	36.4 (19.1-61.3)	1399
Females (2005 - 2006)	*	1.30 (<LOD-2.20)	10.0 (7.50-13.2)	42.7 (32.3-62.8)	98.7 (74.7-147)	1278
Females (2007 - 2008)	*	1.80 (1.40-2.50)	10.1 (6.90-16.5)	62.0 (38.2-80.8)	123 (78.5-259)	1310
Females (2009 - 2010)	3.84 (3.35-4.41)	2.00 (1.60-2.40)	15.4 (12.5-18.4)	62.4 (45.7-78.7)	138 (92.2-211)	1350
Mexican Americans (2005 - 2006)	*	< LOD	3.70 (1.90-6.10)	24.0 (11.6-37.7)	55.6 (40.3-120)	637
Mexican Americans (2007 - 2008)	*	< LOD	4.10 (2.90-5.90)	23.6 (12.8-30.1)	48.3 (31.0-65.2)	531
Mexican Americans (2009 - 2010)	*	< LOD	4.30 (2.60-7.70)	31.0 (21.5-46.3)	65.5 (46.3-92.2)	566
Non-Hispanic blacks (2005 - 2006)	*	1.00 (<LOD-1.50)	5.70 (3.70-9.80)	31.3 (20.4-52.1)	92.3 (41.5-166)	678
Non-Hispanic blacks (2007 - 2008)	*	1.00 (<LOD-1.50)	7.90 (3.90-15.8)	39.9 (24.0-63.4)	97.2 (58.3-256)	597
Non-Hispanic blacks (2009 - 2010)	3.62 (3.11-4.22)	1.90 (1.60-2.40)	11.1 (8.10-17.5)	58.6 (33.8-93.7)	166 (66.0-297)	516
Non-Hispanic whites (2005 - 2006)	*	< LOD	4.80 (3.10-6.10)	24.0 (15.5-32.3)	54.7 (36.4-86.8)	1038
Non-Hispanic whites (2007 - 2008)	*	1.00 (<LOD-1.30)	5.20 (3.50-7.10)	27.2 (18.0-40.8)	67.1 (42.8-98.1)	1077
Non-Hispanic whites (2009 - 2010)	*	1.10 (<LOD-1.20)	6.50 (4.50-8.50)	37.5 (22.7-52.7)	78.7 (49.7-138)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.0, 1.0, and 1.0 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Ethyl paraben (2011 – 2014)

CAS Number 120-47-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	5.10 (4.00-7.10)	33.6 (24.6-42.9)	68.8 (52.1-106)	2489
Total population (2013 - 2014)	*	< LOD	5.30 (4.50-6.50)	33.5 (25.5-46.4)	77.0 (66.4-97.9)	2686
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	3.40 (1.70-6.90)	6.90 (3.40-17.4)	396
Age 6-11 years (2013 - 2014)	*	< LOD	1.30 (1.00-1.70)	5.60 (2.90-8.40)	10.7 (6.60-17.3)	409
Age 12-19 years (2011 - 2012)	*	< LOD	2.00 (1.10-3.10)	9.60 (5.50-14.0)	21.5 (9.60-69.2)	388
Age 12-19 years (2013 - 2014)	*	< LOD	2.40 (1.60-3.40)	15.6 (6.60-29.3)	48.7 (19.4-83.4)	462
Age 20+ years (2011 - 2012)	*	< LOD	7.20 (5.50-10.0)	41.1 (33.4-51.0)	86.5 (58.0-140)	1705
Age 20+ years (2013 - 2014)	*	1.10 (<LOD-1.30)	6.90 (5.50-8.60)	43.3 (32.2-53.4)	84.8 (70.5-114)	1815
Males (2011 - 2012)	*	< LOD	2.20 (1.60-2.90)	10.0 (6.10-18.9)	31.2 (18.9-39.8)	1259
Males (2013 - 2014)	*	< LOD	2.40 (1.80-3.10)	8.50 (6.00-14.4)	34.0 (15.6-62.8)	1285
Females (2011 - 2012)	*	1.60 (1.10-2.60)	12.9 (9.40-17.5)	58.2 (45.4-68.8)	145 (86.5-153)	1230
Females (2013 - 2014)	*	1.60 (1.20-2.30)	12.5 (8.60-17.8)	58.7 (46.4-72.9)	110 (81.5-149)	1401
Mexican Americans (2011 - 2012)	*	< LOD	4.40 (2.40-6.40)	22.0 (12.9-35.5)	45.4 (22.4-171)	316
Mexican Americans (2013 - 2014)	*	< LOD	4.20 (2.60-7.70)	32.6 (16.7-53.4)	70.6 (52.5-123)	438
Non-Hispanic blacks (2011 - 2012)	*	1.50 (1.10-2.00)	8.00 (5.80-12.8)	55.4 (33.4-79.7)	106 (82.8-139)	665
Non-Hispanic blacks (2013 - 2014)	*	1.40 (1.10-1.90)	6.80 (4.90-9.20)	48.8 (29.9-77.0)	115 (77.0-230)	609
Non-Hispanic whites (2011 - 2012)	*	< LOD	4.60 (3.50-9.10)	33.6 (21.6-45.4)	62.6 (42.9-132)	813
Non-Hispanic whites (2013 - 2014)	*	< LOD	5.20 (3.90-6.50)	29.2 (17.8-46.4)	68.5 (48.7-86.6)	988
All Hispanics (2011 - 2012)	*	< LOD	4.50 (3.00-5.80)	24.4 (15.2-34.6)	55.9 (27.1-115)	571
All Hispanics (2013 - 2014)	*	< LOD	5.50 (3.70-8.70)	35.5 (23.9-53.4)	90.4 (62.5-123)	690
Asians (2011 - 2012)	*	< LOD	4.90 (3.40-8.30)	39.4 (16.0-59.1)	92.4 (43.4-186)	352
Asians (2013 - 2014)	*	< LOD	6.00 (2.70-11.3)	52.1 (27.4-75.0)	99.9 (65.5-174)	289

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 13-14 are 1.0 and 1.0, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Ethyl paraben (creatinine corrected) (2005 – 2010)

CAS Number 120-47-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	4.61 (3.39-6.30)	27.1 (19.1-34.0)	66.5 (46.5-84.2)	2548
Total population (2007 - 2008)	*	< LOD	5.56 (4.31-7.56)	32.7 (22.5-50.2)	80.0 (53.2-117)	2604
Total population (2009 - 2010)	*	1.65 (<LOD-1.82)	6.11 (4.90-7.96)	36.6 (28.0-47.2)	94.6 (67.3-127)	2749
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	4.18 (1.91-10.2)	13.5 (4.18-29.0)	356
Age 6-11 years (2007 - 2008)	*	< LOD	2.54 (1.82-3.30)	6.13 (3.26-34.3)	34.3 (3.30-207)	389
Age 6-11 years (2009 - 2010)	*	< LOD	2.37 (1.97-3.09)	5.00 (3.74-6.67)	10.1 (6.11-27.3)	415
Age 12-19 years (2005 - 2006)	*	< LOD	1.94 (1.29-2.65)	10.9 (3.57-20.2)	32.0 (14.1-57.8)	702
Age 12-19 years (2007 - 2008)	*	< LOD	2.93 (1.93-3.97)	12.9 (4.60-37.9)	37.9 (8.79-110)	401
Age 12-19 years (2009 - 2010)	*	< LOD	3.11 (2.22-5.94)	26.2 (13.0-33.9)	52.4 (28.8-177)	420
Age 20+ years (2005 - 2006)	*	< LOD	6.36 (4.63-7.92)	32.4 (23.7-46.0)	76.8 (57.3-97.9)	1490
Age 20+ years (2007 - 2008)	*	1.58 (<LOD-1.97)	6.97 (4.94-10.9)	38.5 (24.8-61.9)	94.1 (53.6-146)	1814
Age 20+ years (2009 - 2010)	*	1.82 (1.61-2.13)	8.08 (5.92-10.7)	43.7 (33.1-56.0)	106 (78.1-137)	1914
Males (2005 - 2006)	*	< LOD	1.82 (1.48-2.15)	6.38 (3.55-9.95)	15.5 (10.2-22.3)	1270
Males (2007 - 2008)	*	< LOD	2.14 (1.67-3.03)	8.61 (5.54-12.4)	21.7 (11.7-32.7)	1294
Males (2009 - 2010)	*	< LOD	2.45 (2.22-2.92)	8.63 (6.14-13.7)	28.8 (14.4-43.2)	1399
Females (2005 - 2006)	*	2.09 (<LOD-2.60)	12.7 (8.45-16.2)	57.3 (40.7-75.2)	107 (82.9-141)	1278
Females (2007 - 2008)	*	2.63 (2.09-3.55)	13.9 (9.09-22.5)	66.1 (40.9-95.1)	130 (78.8-203)	1310
Females (2009 - 2010)	4.63 (4.13-5.19)	2.90 (2.47-3.43)	16.8 (13.7-22.0)	71.9 (53.4-98.8)	173 (121-227)	1350
Mexican Americans (2005 - 2006)	*	< LOD	3.49 (2.09-5.23)	23.6 (11.8-33.2)	68.5 (32.1-107)	637
Mexican Americans (2007 - 2008)	*	< LOD	4.44 (2.86-5.81)	22.5 (15.9-27.2)	47.7 (26.7-74.2)	531
Mexican Americans (2009 - 2010)	*	< LOD	4.40 (3.09-6.31)	30.0 (16.0-36.9)	59.1 (36.9-87.2)	566
Non-Hispanic blacks (2005 - 2006)	*	.970 (<LOD-1.14)	4.48 (2.90-6.07)	22.0 (14.1-36.8)	47.5 (33.7-106)	678
Non-Hispanic blacks (2007 - 2008)	*	1.18 (<LOD-1.47)	6.37 (3.20-10.9)	38.8 (16.5-53.1)	90.7 (42.6-172)	597
Non-Hispanic blacks (2009 - 2010)	2.62 (2.14-3.21)	1.57 (1.20-2.05)	7.35 (5.15-9.97)	44.9 (22.0-75.0)	98.8 (60.0-162)	516
Non-Hispanic whites (2005 - 2006)	*	< LOD	4.73 (3.38-6.58)	27.5 (16.2-38.4)	70.6 (46.0-91.2)	1038
Non-Hispanic whites (2007 - 2008)	*	1.48 (<LOD-1.82)	5.71 (3.74-8.97)	32.3 (20.0-53.6)	75.7 (40.5-121)	1077
Non-Hispanic whites (2009 - 2010)	*	1.79 (<LOD-2.03)	6.63 (4.84-9.18)	37.7 (27.7-53.4)	114 (62.8-164)	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Ethyl paraben (creatinine corrected) (2011 – 2014)

CAS Number 120-47-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	6.57 (5.32-8.80)	39.5 (28.4-50.6)	87.7 (63.6-121)	2487
Total population (2013 - 2014)	*	< LOD	5.41 (4.31-6.33)	36.6 (26.5-47.5)	99.3 (69.5-129)	2684
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	5.92 (3.74-7.50)	7.95 (6.51-17.8)	395
Age 6-11 years (2013 - 2014)	*	< LOD	2.45 (2.03-2.96)	6.30 (3.94-9.44)	12.4 (7.02-26.6)	409
Age 12-19 years (2011 - 2012)	*	< LOD	2.53 (1.81-3.83)	11.1 (6.70-14.5)	20.5 (11.9-44.1)	388
Age 12-19 years (2013 - 2014)	*	< LOD	2.24 (1.83-2.81)	11.8 (4.44-15.7)	36.1 (13.2-73.2)	462
Age 20+ years (2011 - 2012)	*	< LOD	9.17 (6.69-12.5)	46.4 (34.7-64.8)	110 (71.5-146)	1704
Age 20+ years (2013 - 2014)	*	1.57 (<LOD-1.84)	6.97 (5.76-8.73)	47.0 (35.1-63.1)	113 (76.0-169)	1813
Males (2011 - 2012)	*	< LOD	2.45 (2.07-2.94)	8.76 (5.32-14.2)	23.2 (13.2-33.1)	1258
Males (2013 - 2014)	*	< LOD	2.17 (1.78-2.63)	7.89 (5.23-12.5)	26.6 (13.8-41.0)	1284
Females (2011 - 2012)	*	2.96 (2.37-4.08)	18.9 (12.5-27.6)	81.9 (55.6-121)	146 (115-181)	1229
Females (2013 - 2014)	*	2.54 (2.09-3.05)	14.5 (10.3-20.8)	73.2 (51.8-104)	167 (104-221)	1400
Mexican Americans (2011 - 2012)	*	< LOD	4.73 (3.29-8.92)	25.4 (14.2-33.9)	45.4 (32.6-121)	316
Mexican Americans (2013 - 2014)	*	< LOD	4.85 (3.13-8.28)	33.9 (16.4-60.9)	75.8 (30.0-319)	438
Non-Hispanic blacks (2011 - 2012)	*	1.39 (1.06-1.75)	6.98 (4.74-8.92)	40.2 (24.8-55.3)	79.3 (61.1-135)	665
Non-Hispanic blacks (2013 - 2014)	*	1.20 (1.05-1.39)	5.13 (3.53-7.24)	30.6 (18.4-38.8)	77.2 (38.8-129)	609
Non-Hispanic whites (2011 - 2012)	*	< LOD	7.20 (4.88-10.4)	40.1 (26.4-63.5)	93.8 (58.4-131)	811
Non-Hispanic whites (2013 - 2014)	*	< LOD	5.25 (3.95-6.33)	36.6 (22.0-51.9)	87.1 (51.9-162)	987
All Hispanics (2011 - 2012)	*	< LOD	5.03 (3.74-7.13)	31.6 (13.2-54.0)	60.2 (43.6-121)	571
All Hispanics (2013 - 2014)	*	< LOD	6.55 (3.94-8.72)	35.1 (26.6-56.1)	103 (56.1-135)	690
Asians (2011 - 2012)	*	< LOD	7.21 (4.46-13.6)	48.9 (26.3-78.9)	100 (50.4-149)	352
Asians (2013 - 2014)	*	< LOD	7.52 (3.33-14.6)	65.9 (36.9-105)	116 (80.6-191)	288

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Methyl paraben (2005 – 2010)

CAS Number 99-76-3

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	56.4 (46.9-67.9)	63.5 (47.9-74.5)	216 (168-282)	560 (432-777)	974 (827-1110)	2548
Total population (2007 - 2008)	60.1 (49.6-72.8)	59.8 (47.5-73.3)	204 (171-253)	544 (444-675)	902 (746-1100)	2604
Total population (2009 - 2010)	57.1 (51.0-63.9)	55.1 (46.7-62.6)	213 (179-259)	621 (546-716)	1010 (919-1170)	2749
Age 6-11 years (2005 - 2006)	33.5 (25.6-43.8)	25.0 (19.4-35.3)	86.7 (61.5-153)	289 (238-868)	1560 (389-2090)	356
Age 6-11 years (2007 - 2008)	35.2 (25.0-49.6)	30.1 (19.6-38.5)	94.0 (46.6-214)	340 (218-527)	651 (430-995)	389
Age 6-11 years (2009 - 2010)	33.9 (27.4-41.9)	26.5 (20.4-33.3)	79.4 (59.0-126)	415 (163-849)	873 (477-1230)	415
Age 12-19 years (2005 - 2006)	53.8 (43.9-66.0)	53.5 (39.4-65.7)	192 (163-264)	491 (380-720)	901 (571-1210)	702
Age 12-19 years (2007 - 2008)	64.9 (50.3-83.8)	66.3 (48.0-96.7)	221 (180-276)	521 (424-789)	971 (574-1390)	401
Age 12-19 years (2009 - 2010)	53.9 (40.9-70.9)	56.5 (39.4-75.6)	176 (122-291)	716 (399-934)	984 (805-1210)	420
Age 20+ years (2005 - 2006)	60.3 (48.7-74.7)	70.0 (57.1-85.3)	225 (177-322)	602 (439-814)	974 (827-1110)	1490
Age 20+ years (2007 - 2008)	63.0 (51.8-76.7)	64.0 (51.4-79.8)	210 (172-267)	558 (447-678)	916 (743-1190)	1814
Age 20+ years (2009 - 2010)	61.0 (53.5-69.6)	59.1 (50.6-72.6)	239 (188-276)	625 (566-711)	1010 (909-1270)	1914
Males (2005 - 2006)	29.8 (24.8-35.8)	23.7 (19.5-29.4)	97.6 (78.1-121)	299 (229-355)	491 (385-743)	1270
Males (2007 - 2008)	33.6 (27.3-41.3)	27.4 (20.8-39.9)	93.5 (71.0-137)	312 (260-407)	598 (460-734)	1294
Males (2009 - 2010)	31.7 (27.6-36.4)	25.3 (20.6-30.6)	94.0 (76.8-122)	366 (275-482)	727 (569-919)	1399
Females (2005 - 2006)	104 (80.8-135)	137 (93.0-168)	356 (279-427)	842 (660-974)	1110 (956-1330)	1278
Females (2007 - 2008)	105 (90.2-123)	116 (95.2-139)	315 (248-424)	683 (558-901)	1140 (917-1420)	1310
Females (2009 - 2010)	100 (87.9-114)	106 (90.9-125)	349 (271-405)	812 (696-931)	1230 (1010-1550)	1350
Mexican Americans (2005 - 2006)	78.2 (61.0-100)	86.3 (64.7-121)	301 (233-349)	742 (474-896)	1100 (896-1170)	637
Mexican Americans (2007 - 2008)	80.5 (66.0-98.2)	87.0 (63.4-117)	283 (222-348)	630 (533-791)	1030 (773-1240)	531
Mexican Americans (2009 - 2010)	82.9 (68.6-100)	85.5 (73.0-99.8)	293 (231-385)	821 (536-1120)	1580 (855-2360)	566
Non-Hispanic blacks (2005 - 2006)	174 (133-229)	216 (150-306)	616 (465-789)	1180 (1010-1480)	1690 (1210-2880)	678
Non-Hispanic blacks (2007 - 2008)	152 (135-171)	159 (135-194)	483 (421-552)	1080 (938-1350)	1720 (1210-2700)	597
Non-Hispanic blacks (2009 - 2010)	191 (171-213)	223 (170-288)	678 (533-849)	1470 (1220-2010)	2340 (1650-2750)	516
Non-Hispanic whites (2005 - 2006)	43.8 (36.7-52.3)	44.3 (36.7-58.2)	165 (132-209)	412 (320-520)	806 (485-974)	1038
Non-Hispanic whites (2007 - 2008)	48.9 (39.9-59.9)	47.6 (37.8-62.0)	158 (129-198)	430 (301-557)	671 (524-921)	1077
Non-Hispanic whites (2009 - 2010)	43.5 (39.4-48.1)	41.3 (33.5-47.7)	150 (127-176)	463 (361-557)	757 (619-888)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 1.0, 1.0, and 1.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Methyl paraben (2011 – 2014)

CAS Number 99-76-3

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	40.3 (35.4-46.0)	39.0 (32.4-47.8)	172 (149-198)	471 (401-593)	841 (692-975)	2489
Total population (2013 - 2014)	48.1 (43.0-53.8)	41.7 (34.5-50.4)	167 (151-186)	445 (404-509)	819 (663-918)	2686
Age 6-11 years (2011 - 2012)	18.5 (15.7-21.9)	13.8 (11.2-17.7)	58.6 (43.8-78.2)	217 (155-363)	549 (329-983)	396
Age 6-11 years (2013 - 2014)	28.6 (21.4-38.1)	22.7 (17.8-30.3)	62.1 (43.5-100)	260 (150-408)	542 (290-878)	409
Age 12-19 years (2011 - 2012)	26.3 (19.0-36.5)	17.0 (9.80-31.2)	121 (62.4-219)	538 (376-667)	772 (609-996)	388
Age 12-19 years (2013 - 2014)	40.5 (32.7-50.1)	32.0 (25.2-41.7)	147 (89.6-193)	452 (309-725)	942 (612-1220)	462
Age 20+ years (2011 - 2012)	46.8 (41.3-53.1)	48.9 (37.8-61.0)	188 (158-231)	477 (409-611)	870 (676-1070)	1705
Age 20+ years (2013 - 2014)	52.2 (46.0-59.3)	46.8 (37.8-57.3)	179 (163-201)	457 (417-525)	823 (663-918)	1815
Males (2011 - 2012)	23.2 (19.2-28.1)	17.3 (12.5-23.4)	81.9 (65.7-119)	312 (224-396)	575 (401-822)	1259
Males (2013 - 2014)	31.1 (26.8-36.2)	24.4 (20.1-29.8)	77.2 (67.2-94.6)	273 (230-328)	561 (408-740)	1285
Females (2011 - 2012)	68.6 (59.0-79.9)	76.9 (67.5-89.2)	248 (201-309)	637 (493-819)	972 (772-1190)	1230
Females (2013 - 2014)	72.8 (63.6-83.4)	73.9 (61.0-94.1)	248 (217-276)	583 (490-680)	904 (801-1070)	1401
Mexican Americans (2011 - 2012)	43.9 (31.5-61.2)	44.9 (26.2-68.1)	192 (111-302)	529 (328-912)	1080 (471-1740)	316
Mexican Americans (2013 - 2014)	62.1 (49.2-78.4)	57.4 (45.1-84.0)	230 (154-341)	518 (361-725)	915 (535-1530)	438
Non-Hispanic blacks (2011 - 2012)	123 (100-152)	155 (115-199)	450 (341-579)	934 (819-1110)	1390 (1020-1990)	665
Non-Hispanic blacks (2013 - 2014)	111 (96.1-129)	110 (86.4-143)	375 (313-482)	927 (709-1180)	1430 (1020-2040)	609
Non-Hispanic whites (2011 - 2012)	31.0 (26.9-35.8)	30.0 (23.4-36.4)	130 (96.8-160)	372 (269-453)	603 (453-772)	813
Non-Hispanic whites (2013 - 2014)	37.9 (32.8-43.7)	32.5 (28.3-39.0)	123 (94.3-153)	328 (267-391)	573 (422-711)	988
All Hispanics (2011 - 2012)	50.1 (40.5-62.1)	46.0 (39.5-59.4)	203 (130-301)	666 (406-1080)	1170 (766-2100)	571
All Hispanics (2013 - 2014)	61.9 (52.2-73.3)	60.0 (49.0-73.5)	221 (161-291)	539 (417-702)	842 (639-1070)	690
Asians (2011 - 2012)	36.1 (29.2-44.5)	37.1 (24.6-57.4)	140 (97.9-175)	395 (259-509)	692 (461-1030)	352
Asians (2013 - 2014)	45.0 (37.9-53.5)	38.9 (30.5-53.0)	168 (118-197)	384 (271-475)	663 (393-914)	289

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 13-14 are 1.0 and 1.0, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Methyl paraben (creatinine corrected) (2005 – 2010)

CAS Number 99-76-3

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	55.0 (46.8-64.6)	58.8 (47.0-73.4)	221 (170-264)	527 (426-685)	902 (753-995)	2548
Total population (2007 - 2008)	60.6 (49.8-73.8)	61.0 (45.3-83.2)	228 (188-288)	538 (439-645)	820 (694-1000)	2604
Total population (2009 - 2010)	59.6 (53.5-66.3)	57.7 (52.3-68.5)	232 (195-262)	544 (468-632)	887 (734-1020)	2749
Age 6-11 years (2005 - 2006)	36.8 (27.9-48.7)	26.9 (21.0-36.6)	108 (55.9-164)	259 (195-753)	1540 (313-2510)	356
Age 6-11 years (2007 - 2008)	43.4 (31.3-60.2)	33.1 (21.8-55.0)	118 (62.3-197)	424 (218-668)	817 (558-1020)	389
Age 6-11 years (2009 - 2010)	44.2 (35.7-54.6)	32.3 (26.5-42.9)	110 (67.6-158)	483 (258-722)	849 (535-1080)	415
Age 12-19 years (2005 - 2006)	40.1 (33.7-47.8)	41.7 (31.5-56.3)	160 (129-178)	362 (280-428)	549 (434-656)	702
Age 12-19 years (2007 - 2008)	50.5 (40.1-63.7)	52.8 (36.6-78.1)	167 (111-245)	336 (292-395)	475 (376-623)	401
Age 12-19 years (2009 - 2010)	43.3 (33.5-55.9)	43.5 (27.5-68.6)	168 (123-221)	399 (292-558)	632 (425-890)	420
Age 20+ years (2005 - 2006)	60.5 (50.5-72.5)	69.6 (51.5-90.9)	251 (189-320)	602 (462-729)	930 (788-1010)	1490
Age 20+ years (2007 - 2008)	64.7 (52.9-79.2)	69.7 (51.1-92.5)	256 (209-316)	576 (450-710)	865 (697-1130)	1814
Age 20+ years (2009 - 2010)	64.6 (57.0-73.3)	71.2 (56.6-84.7)	251 (217-287)	566 (495-673)	924 (753-1060)	1914
Males (2005 - 2006)	23.9 (20.6-27.8)	21.1 (17.4-25.3)	72.1 (58.0-89.5)	209 (160-260)	368 (262-498)	1270
Males (2007 - 2008)	28.3 (22.8-35.0)	23.5 (17.2-33.2)	80.7 (56.9-111)	257 (181-318)	444 (386-558)	1294
Males (2009 - 2010)	28.4 (25.1-32.2)	23.3 (19.3-26.9)	77.7 (59.6-105)	260 (212-370)	516 (412-633)	1399
Females (2005 - 2006)	123 (99.3-152)	147 (111-196)	377 (319-445)	788 (676-910)	1050 (937-1290)	1278
Females (2007 - 2008)	126 (109-145)	160 (134-182)	374 (325-422)	734 (576-879)	1040 (835-1260)	1310
Females (2009 - 2010)	121 (107-137)	146 (125-162)	359 (307-426)	745 (606-890)	1080 (924-1390)	1350
Mexican Americans (2005 - 2006)	70.3 (57.1-86.7)	85.8 (67.2-106)	249 (191-303)	515 (431-656)	870 (656-1080)	637
Mexican Americans (2007 - 2008)	78.5 (63.6-97.0)	96.2 (59.4-127)	293 (245-370)	627 (541-728)	831 (729-963)	531
Mexican Americans (2009 - 2010)	82.3 (71.1-95.2)	95.2 (76.0-113)	284 (237-337)	623 (459-899)	1130 (657-2120)	566
Non-Hispanic blacks (2005 - 2006)	122 (93.0-161)	161 (98.2-225)	377 (334-462)	792 (581-1100)	1220 (916-1590)	678
Non-Hispanic blacks (2007 - 2008)	118 (105-133)	134 (111-155)	356 (311-403)	757 (573-882)	1030 (847-1290)	597
Non-Hispanic blacks (2009 - 2010)	138 (118-163)	165 (127-203)	403 (356-498)	928 (729-1120)	1350 (1080-1680)	516
Non-Hispanic whites (2005 - 2006)	46.1 (39.0-54.4)	45.6 (34.5-59.7)	170 (142-234)	447 (339-706)	814 (640-995)	1038
Non-Hispanic whites (2007 - 2008)	51.0 (40.5-64.2)	46.7 (35.8-66.3)	191 (154-230)	481 (383-614)	747 (574-966)	1077
Non-Hispanic whites (2009 - 2010)	48.9 (44.5-53.7)	45.9 (39.5-51.9)	184 (154-215)	468 (388-560)	734 (631-924)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary Methyl paraben (creatinine corrected) (2011 – 2014)

CAS Number 99-76-3

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	46.0 (41.3-51.3)	47.9 (36.9-61.7)	203 (179-228)	494 (399-571)	797 (632-993)	2487
Total population (2013 - 2014)	48.2 (43.1-53.9)	41.8 (35.5-49.1)	180 (145-205)	410 (379-460)	653 (585-697)	2684
Age 6-11 years (2011 - 2012)	26.4 (22.8-30.7)	19.4 (14.6-23.8)	69.9 (53.0-113)	282 (182-458)	644 (354-1220)	395
Age 6-11 years (2013 - 2014)	36.1 (28.0-46.5)	28.2 (20.9-36.5)	72.7 (50.9-122)	263 (160-564)	588 (341-881)	409
Age 12-19 years (2011 - 2012)	25.7 (19.3-34.2)	17.1 (11.8-33.4)	100 (53.2-175)	335 (213-545)	609 (450-773)	388
Age 12-19 years (2013 - 2014)	32.9 (27.7-39.0)	24.3 (18.1-33.8)	99.5 (75.3-145)	339 (234-412)	495 (377-655)	462
Age 20+ years (2011 - 2012)	53.4 (47.7-59.8)	64.9 (53.2-75.2)	228 (199-250)	523 (429-623)	815 (669-1110)	1704
Age 20+ years (2013 - 2014)	52.6 (46.6-59.4)	47.5 (38.7-58.5)	199 (170-229)	429 (390-476)	666 (591-781)	1813
Males (2011 - 2012)	21.8 (18.3-26.0)	16.2 (12.5-21.1)	74.1 (57.1-93.3)	250 (181-321)	450 (327-560)	1258
Males (2013 - 2014)	26.1 (22.9-29.8)	18.4 (16.6-22.2)	61.3 (52.1-74.0)	215 (172-284)	411 (323-479)	1284
Females (2011 - 2012)	94.5 (83.1-108)	119 (101-136)	309 (259-356)	682 (571-805)	1090 (797-1300)	1229
Females (2013 - 2014)	86.5 (74.1-101)	90.5 (72.2-125)	266 (237-307)	564 (506-614)	828 (665-998)	1400
Mexican Americans (2011 - 2012)	49.5 (37.0-66.2)	50.5 (32.5-79.7)	200 (133-298)	496 (316-982)	1090 (484-2160)	316
Mexican Americans (2013 - 2014)	63.3 (46.8-85.5)	67.9 (45.6-96.0)	229 (146-317)	570 (360-764)	883 (578-1130)	438
Non-Hispanic blacks (2011 - 2012)	96.1 (79.4-116)	117 (88.0-157)	341 (274-382)	696 (626-842)	1090 (879-1190)	665
Non-Hispanic blacks (2013 - 2014)	82.0 (75.2-89.5)	84.6 (65.8-100)	251 (211-289)	584 (521-672)	924 (655-1120)	609
Non-Hispanic whites (2011 - 2012)	37.8 (33.1-43.2)	33.4 (25.7-47.6)	177 (141-208)	425 (321-556)	719 (544-833)	811
Non-Hispanic whites (2013 - 2014)	39.9 (34.5-46.2)	31.8 (26.4-38.7)	139 (104-182)	357 (294-404)	560 (444-640)	987
All Hispanics (2011 - 2012)	56.1 (46.3-68.0)	57.1 (47.2-75.2)	217 (160-332)	577 (456-813)	1090 (662-1490)	571
All Hispanics (2013 - 2014)	61.4 (49.8-75.7)	60.8 (51.7-74.6)	227 (179-270)	542 (390-637)	774 (570-1070)	690
Asians (2011 - 2012)	48.3 (39.5-59.2)	54.9 (31.6-79.8)	198 (167-238)	473 (344-600)	840 (528-1170)	352
Asians (2013 - 2014)	56.9 (45.2-71.6)	59.1 (35.7-82.0)	202 (160-275)	469 (365-608)	761 (475-911)	288

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary n-Propyl paraben (2005 – 2010)

CAS Number 94-13-3

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	7.91 (6.41-9.77)	8.70 (5.90-12.4)	48.9 (36.6-64.8)	160 (129-200)	299 (237-354)	2548
Total population (2007 - 2008)	7.59 (6.22-9.26)	7.60 (5.70-10.6)	44.1 (34.1-55.6)	144 (115-196)	268 (231-290)	2604
Total population (2009 - 2010)	6.97 (5.96-8.16)	6.40 (5.10-8.00)	44.3 (38.6-50.3)	153 (133-183)	297 (233-334)	2749
Age 6-11 years (2005 - 2006)	3.41 (2.43-4.77)	2.50 (1.60-4.30)	11.1 (7.10-21.0)	47.5 (30.0-91.9)	125 (55.8-383)	356
Age 6-11 years (2007 - 2008)	3.61 (2.39-5.44)	3.50 (1.90-6.00)	13.7 (7.60-22.8)	49.1 (21.7-99.6)	99.6 (80.4-120)	389
Age 6-11 years (2009 - 2010)	3.28 (2.58-4.17)	2.70 (2.00-4.00)	10.2 (7.00-14.0)	42.9 (28.2-61.6)	114 (56.8-239)	415
Age 12-19 years (2005 - 2006)	8.16 (5.70-11.7)	8.40 (5.00-13.9)	46.4 (24.1-68.5)	165 (96.7-222)	310 (201-361)	702
Age 12-19 years (2007 - 2008)	8.85 (6.73-11.6)	7.90 (5.30-12.0)	49.2 (31.1-62.2)	193 (100-234)	271 (195-314)	401
Age 12-19 years (2009 - 2010)	7.01 (5.13-9.58)	7.90 (4.40-11.0)	39.7 (24.8-57.8)	153 (78.1-299)	367 (136-694)	420
Age 20+ years (2005 - 2006)	8.67 (6.83-11.0)	11.2 (7.70-14.4)	55.6 (41.2-75.6)	172 (130-233)	302 (237-367)	1490
Age 20+ years (2007 - 2008)	8.04 (6.56-9.84)	8.40 (6.10-11.9)	48.8 (38.3-61.1)	152 (118-202)	272 (232-312)	1814
Age 20+ years (2009 - 2010)	7.58 (6.28-9.15)	7.50 (5.30-9.90)	48.9 (42.6-58.0)	166 (139-199)	298 (251-334)	1914
Males (2005 - 2006)	2.96 (2.33-3.77)	2.30 (1.60-3.10)	13.8 (9.00-18.0)	51.7 (39.7-70.9)	125 (77.2-185)	1270
Males (2007 - 2008)	3.02 (2.47-3.71)	2.30 (1.70-3.30)	12.6 (8.40-17.4)	56.4 (38.9-89.5)	140 (98.1-209)	1294
Males (2009 - 2010)	2.77 (2.26-3.40)	2.00 (1.40-2.60)	11.4 (7.70-15.4)	57.3 (44.6-67.8)	134 (86.1-184)	1399
Females (2005 - 2006)	20.4 (16.0-25.9)	29.1 (21.6-37.5)	93.0 (75.7-129)	254 (193-318)	357 (318-395)	1278
Females (2007 - 2008)	18.4 (15.7-21.5)	23.3 (20.5-26.1)	76.3 (62.9-100)	210 (164-269)	312 (271-363)	1310
Females (2009 - 2010)	16.9 (14.6-19.4)	20.2 (17.0-25.9)	83.3 (70.0-92.4)	227 (171-295)	361 (297-502)	1350
Mexican Americans (2005 - 2006)	10.6 (8.08-13.8)	12.1 (7.00-17.5)	65.9 (43.5-93.3)	247 (174-293)	389 (293-453)	637
Mexican Americans (2007 - 2008)	7.82 (5.98-10.2)	7.00 (4.20-12.9)	52.1 (36.9-64.1)	146 (105-201)	217 (161-401)	531
Mexican Americans (2009 - 2010)	8.94 (7.25-11.0)	8.70 (5.70-13.3)	58.9 (45.7-68.5)	182 (117-299)	451 (269-911)	566
Non-Hispanic blacks (2005 - 2006)	26.8 (21.5-33.3)	34.7 (28.3-44.2)	125 (89.5-165)	331 (236-411)	531 (367-730)	678
Non-Hispanic blacks (2007 - 2008)	21.3 (18.4-24.7)	28.6 (21.8-34.8)	85.4 (70.8-96.9)	222 (176-282)	410 (277-506)	597
Non-Hispanic blacks (2009 - 2010)	26.1 (21.8-31.3)	29.9 (23.4-39.5)	129 (87.4-167)	322 (229-503)	572 (369-654)	516
Non-Hispanic whites (2005 - 2006)	6.21 (5.02-7.68)	6.00 (4.60-9.10)	35.7 (28.4-49.6)	130 (92.1-157)	229 (156-318)	1038
Non-Hispanic whites (2007 - 2008)	6.49 (5.05-8.33)	6.10 (4.50-9.20)	36.8 (26.9-47.5)	129 (91.3-196)	251 (190-290)	1077
Non-Hispanic whites (2009 - 2010)	5.34 (4.55-6.27)	4.40 (3.60-5.70)	35.6 (26.1-44.3)	128 (92.4-141)	235 (170-300)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.2, 0.2, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary n-Propyl paraben (2011 – 2014)

CAS Number 94-13-3

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	5.39 (4.69-6.19)	4.70 (3.80-5.90)	28.5 (24.5-34.1)	126 (94.0-142)	200 (163-278)	2489
Total population (2013 - 2014)	5.74 (5.06-6.50)	4.80 (3.90-5.70)	33.7 (27.1-41.1)	120 (106-130)	224 (193-284)	2686
Age 6-11 years (2011 - 2012)	2.20 (1.81-2.68)	1.40 (1.20-1.80)	6.40 (4.80-11.8)	28.1 (17.9-53.4)	77.7 (41.3-185)	396
Age 6-11 years (2013 - 2014)	2.96 (2.20-3.99)	2.40 (1.80-2.80)	7.60 (5.90-15.4)	44.7 (28.5-75.6)	113 (45.3-213)	409
Age 12-19 years (2011 - 2012)	3.69 (2.77-4.92)	2.80 (1.80-4.20)	14.7 (9.50-23.4)	81.8 (51.5-151)	208 (122-357)	388
Age 12-19 years (2013 - 2014)	5.15 (3.89-6.83)	3.10 (2.40-4.90)	24.5 (12.5-54.0)	119 (90.5-147)	217 (139-299)	462
Age 20+ years (2011 - 2012)	6.29 (5.45-7.25)	6.20 (4.80-8.50)	35.4 (29.2-43.2)	135 (98.1-151)	213 (163-323)	1705
Age 20+ years (2013 - 2014)	6.27 (5.51-7.12)	5.70 (4.40-7.20)	39.2 (31.3-43.2)	126 (112-161)	235 (202-304)	1815
Males (2011 - 2012)	2.44 (1.99-2.98)	1.70 (1.40-2.10)	8.90 (6.70-12.0)	46.5 (28.0-80.6)	137 (65.8-258)	1259
Males (2013 - 2014)	2.61 (2.20-3.09)	1.70 (1.30-2.20)	9.20 (6.20-13.3)	49.8 (37.1-65.8)	128 (94.0-175)	1285
Females (2011 - 2012)	11.6 (10.0-13.4)	13.8 (12.4-16.3)	54.7 (48.6-67.2)	151 (141-175)	252 (183-323)	1230
Females (2013 - 2014)	12.2 (10.6-14.1)	13.5 (10.3-18.2)	57.0 (50.1-67.6)	179 (143-203)	329 (230-376)	1401
Mexican Americans (2011 - 2012)	6.15 (3.98-9.52)	6.50 (2.60-11.1)	30.0 (22.7-57.5)	181 (70.4-312)	312 (146-1060)	316
Mexican Americans (2013 - 2014)	7.76 (5.55-10.8)	6.00 (3.60-14.0)	45.0 (29.7-57.4)	124 (80.7-184)	195 (137-342)	438
Non-Hispanic blacks (2011 - 2012)	16.4 (14.1-19.1)	18.0 (13.4-23.1)	61.1 (49.9-82.9)	183 (147-225)	340 (221-477)	665
Non-Hispanic blacks (2013 - 2014)	15.4 (13.1-18.0)	15.7 (10.8-20.3)	71.8 (58.2-86.4)	249 (187-305)	396 (344-430)	609
Non-Hispanic whites (2011 - 2012)	4.14 (3.57-4.79)	3.30 (2.50-4.20)	21.0 (15.3-30.8)	94.6 (70.3-135)	163 (137-202)	813
Non-Hispanic whites (2013 - 2014)	4.46 (3.78-5.27)	3.40 (2.70-4.20)	23.8 (17.4-32.2)	98.3 (78.6-120)	202 (130-241)	988
All Hispanics (2011 - 2012)	6.87 (5.42-8.71)	6.70 (3.80-9.30)	33.6 (26.1-50.4)	181 (95.3-273)	333 (236-556)	571
All Hispanics (2013 - 2014)	7.73 (6.26-9.56)	6.20 (4.40-10.4)	45.0 (35.7-54.1)	127 (112-157)	207 (165-324)	690
Asians (2011 - 2012)	5.07 (4.06-6.34)	5.50 (3.40-7.70)	27.0 (22.3-37.2)	95.8 (63.6-143)	169 (123-292)	352
Asians (2013 - 2014)	4.42 (3.71-5.27)	3.90 (2.20-8.10)	28.8 (19.3-41.1)	77.8 (60.6-120)	158 (95.5-209)	289

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 13-14 are 0.2 and 0.1, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary n-Propyl paraben (creatinine corrected) (2005 – 2010)

CAS Number 94-13-3

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	7.71 (6.40-9.30)	8.27 (5.87-11.3)	52.9 (41.6-66.1)	161 (140-178)	263 (226-288)	2548
Total population (2007 - 2008)	7.65 (6.22-9.40)	8.00 (5.34-11.6)	50.0 (39.5-59.8)	138 (115-168)	235 (199-293)	2604
Total population (2009 - 2010)	7.28 (6.30-8.41)	6.67 (5.35-8.50)	45.1 (37.3-53.5)	155 (128-187)	253 (223-300)	2749
Age 6-11 years (2005 - 2006)	3.75 (2.67-5.26)	2.70 (1.89-4.43)	11.5 (8.07-16.0)	52.1 (22.9-100)	121 (55.5-352)	356
Age 6-11 years (2007 - 2008)	4.45 (3.03-6.53)	3.50 (1.79-6.85)	16.5 (8.82-28.8)	59.1 (28.6-94.4)	98.4 (65.0-139)	389
Age 6-11 years (2009 - 2010)	4.27 (3.34-5.47)	3.33 (2.41-4.62)	12.0 (8.52-16.6)	46.1 (27.5-108)	143 (72.5-243)	415
Age 12-19 years (2005 - 2006)	6.08 (4.36-8.49)	5.44 (3.03-10.5)	33.0 (20.7-48.7)	116 (81.9-161)	175 (140-239)	702
Age 12-19 years (2007 - 2008)	6.88 (5.30-8.94)	5.68 (3.51-9.90)	33.2 (26.7-46.5)	103 (87.2-112)	132 (105-235)	401
Age 12-19 years (2009 - 2010)	5.64 (4.17-7.62)	5.19 (3.53-9.03)	32.9 (20.4-42.4)	107 (57.6-217)	218 (101-397)	420
Age 20+ years (2005 - 2006)	8.70 (7.08-10.7)	10.8 (7.39-15.2)	63.2 (49.7-80.5)	178 (152-198)	270 (236-293)	1490
Age 20+ years (2007 - 2008)	8.26 (6.70-10.2)	9.91 (6.15-12.6)	57.9 (47.3-69.1)	161 (127-199)	273 (212-312)	1814
Age 20+ years (2009 - 2010)	8.03 (6.74-9.56)	8.27 (6.10-10.8)	55.5 (43.5-66.0)	164 (136-200)	270 (232-314)	1914
Males (2005 - 2006)	2.38 (1.92-2.95)	1.84 (1.42-2.46)	9.52 (6.79-12.8)	40.5 (31.1-51.5)	90.8 (56.8-125)	1270
Males (2007 - 2008)	2.55 (2.06-3.15)	1.74 (1.40-2.53)	10.7 (5.99-15.4)	44.7 (29.0-66.1)	112 (77.4-144)	1294
Males (2009 - 2010)	2.48 (2.05-3.00)	1.71 (1.35-2.25)	8.85 (6.12-14.2)	40.3 (33.8-57.6)	105 (74.5-143)	1399
Females (2005 - 2006)	23.9 (19.9-28.8)	34.9 (26.9-46.6)	114 (101-132)	235 (193-263)	306 (277-342)	1278
Females (2007 - 2008)	22.0 (18.7-25.8)	30.4 (25.2-36.3)	93.3 (80.8-110)	199 (161-245)	302 (271-370)	1310
Females (2009 - 2010)	20.4 (17.8-23.3)	25.7 (21.8-30.7)	97.1 (81.8-115)	223 (191-248)	334 (295-389)	1350
Mexican Americans (2005 - 2006)	9.49 (7.29-12.4)	11.0 (6.69-16.4)	55.2 (44.9-79.6)	186 (147-271)	329 (194-441)	637
Mexican Americans (2007 - 2008)	7.63 (5.72-10.2)	6.60 (4.10-13.4)	47.9 (39.5-66.7)	162 (123-187)	273 (187-304)	531
Mexican Americans (2009 - 2010)	8.87 (7.42-10.6)	7.97 (5.87-12.8)	54.7 (42.3-73.8)	184 (140-269)	325 (221-575)	566
Non-Hispanic blacks (2005 - 2006)	18.8 (15.2-23.3)	23.6 (19.0-30.8)	83.7 (61.8-105)	217 (169-255)	318 (242-377)	678
Non-Hispanic blacks (2007 - 2008)	16.6 (14.1-19.5)	22.9 (18.0-27.2)	64.2 (51.4-73.3)	141 (117-172)	254 (169-311)	597
Non-Hispanic blacks (2009 - 2010)	18.9 (15.2-23.5)	21.1 (18.2-27.7)	80.9 (59.5-109)	200 (151-249)	301 (223-376)	516
Non-Hispanic whites (2005 - 2006)	6.53 (5.32-8.02)	6.45 (3.96-9.11)	47.4 (32.6-65.3)	146 (119-184)	241 (184-278)	1038
Non-Hispanic whites (2007 - 2008)	6.77 (5.14-8.93)	5.81 (3.94-10.5)	45.4 (32.2-61.4)	132 (105-172)	215 (169-295)	1077
Non-Hispanic whites (2009 - 2010)	6.00 (5.19-6.94)	5.12 (4.05-6.25)	37.8 (32.1-49.2)	148 (115-183)	242 (215-272)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary n-Propyl paraben (creatinine corrected) (2011 – 2014)

CAS Number 94-13-3

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	6.16 (5.42-6.99)	5.35 (3.97-7.07)	36.7 (31.1-42.2)	129 (105-162)	215 (183-321)	2487
Total population (2013 - 2014)	5.74 (5.10-6.46)	4.75 (3.81-5.91)	36.7 (30.3-41.9)	124 (99.0-148)	222 (186-253)	2684
Age 6-11 years (2011 - 2012)	3.18 (2.62-3.87)	2.09 (1.58-3.16)	9.11 (5.71-12.2)	37.0 (19.8-53.1)	116 (43.6-202)	395
Age 6-11 years (2013 - 2014)	3.74 (2.84-4.94)	2.73 (1.75-4.00)	10.9 (7.00-18.3)	40.5 (24.4-98.6)	153 (52.1-271)	409
Age 12-19 years (2011 - 2012)	3.60 (2.75-4.70)	2.46 (1.93-3.52)	14.9 (9.36-24.9)	69.8 (32.3-130)	133 (75.6-202)	388
Age 12-19 years (2013 - 2014)	4.18 (3.24-5.39)	2.82 (2.03-4.46)	20.7 (9.86-39.0)	76.0 (56.4-102)	118 (94.2-197)	462
Age 20+ years (2011 - 2012)	7.17 (6.22-8.27)	7.28 (5.23-9.77)	45.7 (38.1-51.6)	152 (117-183)	258 (190-365)	1704
Age 20+ years (2013 - 2014)	6.30 (5.61-7.08)	5.71 (4.40-7.22)	41.8 (35.9-47.8)	138 (112-166)	231 (199-259)	1813
Males (2011 - 2012)	2.29 (1.90-2.75)	1.38 (1.21-1.67)	7.39 (6.02-9.39)	46.2 (28.5-72.7)	94.5 (57.3-190)	1258
Males (2013 - 2014)	2.19 (1.87-2.56)	1.35 (1.17-1.59)	7.42 (5.24-8.93)	42.2 (32.3-52.2)	110 (78.9-141)	1284
Females (2011 - 2012)	16.0 (13.9-18.4)	20.9 (16.7-25.7)	74.7 (62.3-88.7)	185 (164-213)	345 (239-426)	1229
Females (2013 - 2014)	14.4 (12.1-17.2)	17.5 (13.2-22.3)	65.9 (56.9-82.9)	198 (152-226)	281 (237-338)	1400
Mexican Americans (2011 - 2012)	6.93 (4.57-10.5)	7.19 (3.71-10.9)	40.5 (24.4-75.9)	159 (90.0-236)	315 (159-536)	316
Mexican Americans (2013 - 2014)	7.90 (5.27-11.9)	6.75 (3.60-16.0)	52.7 (30.9-67.2)	134 (89.0-205)	231 (158-284)	438
Non-Hispanic blacks (2011 - 2012)	12.8 (11.3-14.4)	13.9 (11.3-18.0)	54.5 (43.4-65.7)	140 (105-185)	207 (166-333)	665
Non-Hispanic blacks (2013 - 2014)	11.4 (10.0-12.9)	10.8 (7.87-13.9)	56.0 (44.6-67.6)	137 (108-186)	233 (191-274)	609
Non-Hispanic whites (2011 - 2012)	5.06 (4.35-5.88)	3.20 (2.50-5.06)	31.1 (27.3-37.1)	120 (88.2-164)	213 (164-345)	811
Non-Hispanic whites (2013 - 2014)	4.69 (4.01-5.48)	3.58 (2.66-4.63)	29.2 (22.9-36.2)	112 (81.6-158)	212 (165-259)	987
All Hispanics (2011 - 2012)	7.70 (5.99-9.90)	7.47 (5.00-10.1)	51.5 (35.2-72.9)	162 (119-196)	318 (185-473)	571
All Hispanics (2013 - 2014)	7.67 (5.91-9.97)	6.40 (4.71-10.3)	46.5 (35.4-61.9)	139 (109-205)	240 (173-285)	690
Asians (2011 - 2012)	6.80 (5.47-8.45)	6.90 (3.41-13.7)	46.5 (35.6-59.5)	136 (94.4-188)	222 (168-304)	352
Asians (2013 - 2014)	5.54 (4.23-7.26)	5.22 (2.70-8.39)	43.9 (31.4-57.0)	104 (87.0-137)	153 (113-250)	288

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Parabens_FactSheet.html

Urinary 2,4-Dichlorophenol (2003 – 2010)

CAS Number 120-83-2

Metabolite of other chlorophenols

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	1.04 (.895-1.21)	.900 (.800-1.10)	2.70 (2.30-3.10)	8.80 (6.60-11.9)	21.3 (14.1-29.5)	2525
Total population (2005 - 2006)	.945 (.791-1.13)	.800 (.700-1.00)	2.00 (1.60-2.40)	4.90 (3.90-6.30)	11.9 (7.00-20.4)	2548
Total population (2007 - 2008)	.970 (.852-1.11)	.800 (.700-.900)	1.80 (1.50-2.30)	5.10 (3.80-7.60)	12.6 (9.00-18.1)	2604
Total population (2009 - 2010)	.803 (.729-.885)	.700 (.700-.800)	1.50 (1.40-1.70)	4.00 (3.30-5.00)	8.80 (6.40-15.7)	2749
Age 6-11 years (2003 - 2004)	1.01 (.796-1.28)	.800 (.600-1.20)	2.30 (1.70-3.20)	7.70 (3.80-20.1)	23.5 (9.40-31.0)	314
Age 6-11 years (2005 - 2006)	1.01 (.879-1.15)	.800 (.800-1.10)	2.00 (1.60-2.30)	4.90 (3.30-6.60)	9.80 (6.30-17.6)	356
Age 6-11 years (2007 - 2008)	1.04 (.778-1.39)	.900 (.700-1.20)	1.80 (1.20-2.80)	5.90 (2.90-10.1)	11.4 (6.60-20.7)	389
Age 6-11 years (2009 - 2010)	.975 (.768-1.24)	.700 (.600-.900)	1.80 (1.40-2.30)	5.00 (3.20-8.40)	14.2 (4.40-90.9)	415
Age 12-19 years (2003 - 2004)	1.27 (.971-1.67)	1.10 (.800-1.50)	3.40 (2.50-5.00)	13.6 (6.10-25.5)	31.5 (14.5-85.0)	722
Age 12-19 years (2005 - 2006)	1.18 (.997-1.39)	1.00 (.900-1.20)	2.50 (2.00-3.10)	5.50 (4.00-8.30)	13.9 (7.10-33.6)	702
Age 12-19 years (2007 - 2008)	1.19 (.989-1.44)	1.10 (.800-1.40)	2.60 (2.00-3.00)	5.60 (3.10-10.8)	11.6 (5.70-36.5)	401
Age 12-19 years (2009 - 2010)	.967 (.794-1.18)	.800 (.700-.900)	1.60 (1.40-2.70)	5.80 (3.70-10.1)	14.4 (7.10-24.8)	420
Age 20+ years (2003 - 2004)	1.01 (.874-1.17)	.900 (.700-1.10)	2.60 (2.20-3.00)	8.50 (6.60-10.4)	19.4 (12.2-27.0)	1489
Age 20+ years (2005 - 2006)	.907 (.737-1.12)	.800 (.600-1.00)	2.00 (1.50-2.40)	4.90 (3.70-6.40)	11.1 (6.50-20.9)	1490
Age 20+ years (2007 - 2008)	.932 (.820-1.06)	.800 (.700-.900)	1.70 (1.40-2.20)	5.00 (3.80-7.60)	13.2 (9.20-18.1)	1814
Age 20+ years (2009 - 2010)	.764 (.699-.836)	.700 (.600-.700)	1.40 (1.30-1.60)	3.60 (3.10-4.50)	8.00 (5.60-13.9)	1914
Males (2003 - 2004)	1.22 (1.02-1.45)	1.10 (.800-1.50)	3.00 (2.50-3.50)	9.40 (6.80-13.9)	22.7 (13.6-40.9)	1231
Males (2005 - 2006)	1.16 (.973-1.37)	1.00 (.900-1.20)	2.40 (2.00-2.80)	5.50 (4.40-7.90)	12.9 (7.30-25.3)	1270
Males (2007 - 2008)	1.06 (.943-1.19)	.900 (.800-1.00)	1.90 (1.60-2.20)	5.40 (3.90-8.20)	13.6 (10.1-18.1)	1294
Males (2009 - 2010)	.879 (.789-.979)	.800 (.700-.800)	1.60 (1.40-1.80)	4.00 (3.20-5.70)	10.4 (5.20-18.4)	1399
Females (2003 - 2004)	.896 (.754-1.07)	.800 (.600-.900)	2.30 (2.00-2.70)	8.10 (5.70-11.1)	19.8 (12.0-27.5)	1294
Females (2005 - 2006)	.779 (.637-.954)	.700 (.500-.800)	1.50 (1.30-2.10)	4.30 (2.80-6.20)	9.40 (5.40-19.6)	1278
Females (2007 - 2008)	.893 (.750-1.06)	.700 (.600-.800)	1.80 (1.20-2.50)	4.70 (3.10-8.00)	11.9 (7.60-18.6)	1310
Females (2009 - 2010)	.737 (.659-.824)	.600 (.600-.700)	1.40 (1.30-1.70)	4.00 (3.00-5.50)	7.80 (5.80-15.8)	1350
Mexican Americans (2003 - 2004)	1.94 (1.46-2.56)	1.70 (1.20-2.10)	4.50 (2.80-9.30)	26.9 (12.7-52.1)	66.0 (47.5-84.2)	617
Mexican Americans (2005 - 2006)	1.97 (1.49-2.59)	1.60 (1.20-2.10)	5.00 (3.30-6.60)	20.9 (8.80-39.7)	46.5 (21.9-79.5)	637
Mexican Americans (2007 - 2008)	1.59 (.969-2.60)	1.20 (.600-2.60)	4.20 (2.10-9.50)	13.4 (7.90-29.6)	38.0 (16.4-74.0)	531
Mexican Americans (2009 - 2010)	1.25 (.860-1.81)	.900 (.700-1.30)	2.70 (1.60-4.30)	11.3 (4.30-26.3)	29.1 (7.60-76.3)	566
Non-Hispanic blacks (2003 - 2004)	2.42 (1.92-3.06)	2.20 (1.70-2.70)	7.40 (4.00-9.60)	20.8 (11.2-38.3)	49.2 (24.0-69.7)	636
Non-Hispanic blacks (2005 - 2006)	2.45 (1.93-3.12)	2.10 (1.70-2.40)	5.20 (3.90-7.40)	20.3 (10.6-36.9)	42.6 (21.3-129)	678
Non-Hispanic blacks (2007 - 2008)	1.73 (1.49-2.01)	1.40 (1.10-1.60)	3.70 (2.90-4.90)	17.8 (9.70-25.8)	37.7 (24.6-56.8)	597
Non-Hispanic blacks (2009 - 2010)	1.54 (1.06-2.23)	1.20 (.800-2.00)	3.10 (2.10-4.80)	12.4 (4.30-46.4)	35.2 (7.80-107)	516
Non-Hispanic whites (2003 - 2004)	.837 (.698-1.00)	.700 (.600-.900)	2.10 (1.70-2.60)	6.20 (4.00-8.80)	13.4 (8.60-22.0)	1077
Non-Hispanic whites (2005 - 2006)	.734 (.610-.883)	.700 (.500-.900)	1.40 (1.20-1.80)	3.10 (2.70-3.90)	5.30 (4.30-7.90)	1038
Non-Hispanic whites (2007 - 2008)	.817 (.732-.911)	.700 (.600-.800)	1.50 (1.20-1.80)	3.10 (2.60-4.40)	6.40 (4.60-8.80)	1077
Non-Hispanic whites (2009 - 2010)	.651 (.594-.712)	.600 (.500-.700)	1.30 (1.10-1.40)	2.80 (2.20-3.50)	5.60 (3.80-7.40)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.17, 0.2, 0.2, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/24D_BiomonitoringSummary.html

Urinary 2,4-Dichlorophenol (2011 – 2014)

CAS Number 120-83-2

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.695 (.619-.781)	.600 (.600-.700)	1.30 (1.10-1.60)	3.50 (2.80-4.40)	9.00 (5.60-13.0)	2489
Total population (2013 - 2014)	.669 (.603-.743)	.600 (.500-.700)	1.30 (1.20-1.40)	3.00 (2.70-3.50)	6.40 (4.80-11.5)	2686
Age 6-11 years (2011 - 2012)	.672 (.558-.810)	.600 (.400-.700)	1.10 (1.00-1.40)	3.60 (1.90-5.50)	11.3 (4.10-23.2)	396
Age 6-11 years (2013 - 2014)	.773 (.646-.925)	.700 (.600-.900)	1.20 (1.10-1.60)	2.90 (2.10-4.80)	8.90 (3.30-21.8)	409
Age 12-19 years (2011 - 2012)	.711 (.591-.857)	.600 (.500-.800)	1.30 (1.00-1.50)	3.30 (2.10-5.80)	9.00 (4.10-13.0)	388
Age 12-19 years (2013 - 2014)	.668 (.576-.775)	.600 (.500-.700)	1.10 (.900-1.40)	2.40 (1.70-4.40)	7.30 (3.10-13.8)	462
Age 20+ years (2011 - 2012)	.695 (.613-.789)	.600 (.500-.700)	1.30 (1.10-1.60)	3.50 (2.80-4.60)	9.00 (5.20-13.1)	1705
Age 20+ years (2013 - 2014)	.659 (.593-.732)	.600 (.500-.700)	1.30 (1.20-1.40)	3.10 (2.70-3.50)	6.20 (4.90-10.8)	1815
Males (2011 - 2012)	.717 (.641-.802)	.600 (.600-.700)	1.30 (1.10-1.60)	3.20 (2.20-4.40)	7.10 (4.60-10.6)	1259
Males (2013 - 2014)	.708 (.637-.786)	.600 (.600-.700)	1.30 (1.10-1.60)	2.90 (2.60-3.30)	6.20 (4.10-11.3)	1285
Females (2011 - 2012)	.675 (.581-.784)	.600 (.500-.700)	1.20 (1.00-1.60)	3.80 (2.80-6.00)	11.1 (4.90-24.3)	1230
Females (2013 - 2014)	.635 (.553-.729)	.600 (.500-.700)	1.20 (1.10-1.40)	3.10 (2.50-4.10)	7.60 (4.40-12.3)	1401
Mexican Americans (2011 - 2012)	.895 (.720-1.11)	.800 (.600-1.00)	1.80 (1.30-2.60)	6.60 (3.50-10.5)	14.5 (7.40-27.0)	316
Mexican Americans (2013 - 2014)	.807 (.609-1.07)	.600 (.400-1.00)	1.70 (1.10-2.90)	4.00 (3.00-12.2)	14.6 (3.90-49.9)	438
Non-Hispanic blacks (2011 - 2012)	1.23 (.965-1.57)	.900 (.800-1.20)	2.20 (1.60-3.30)	6.90 (4.20-14.8)	25.0 (8.40-53.6)	665
Non-Hispanic blacks (2013 - 2014)	1.11 (.791-1.54)	.800 (.700-1.10)	2.00 (1.40-3.30)	8.20 (3.00-28.2)	23.5 (6.50-81.9)	609
Non-Hispanic whites (2011 - 2012)	.577 (.514-.647)	.500 (.500-.600)	1.00 (.900-1.20)	2.50 (1.70-3.70)	4.90 (3.30-9.40)	813
Non-Hispanic whites (2013 - 2014)	.588 (.525-.659)	.500 (.500-.600)	1.10 (1.00-1.30)	2.60 (2.30-2.90)	4.60 (3.10-5.50)	988
All Hispanics (2011 - 2012)	.981 (.760-1.27)	.800 (.600-1.00)	2.10 (1.30-3.10)	6.10 (3.90-13.0)	15.9 (7.00-42.0)	571
All Hispanics (2013 - 2014)	.786 (.641-.965)	.600 (.500-.800)	1.60 (1.20-2.10)	3.50 (3.10-7.80)	12.4 (4.20-26.1)	690
Asians (2011 - 2012)	.621 (.478-.807)	.500 (.400-.700)	1.10 (.800-1.60)	3.60 (1.70-7.10)	11.1 (3.50-17.7)	352
Asians (2013 - 2014)	.567 (.435-.738)	.500 (.300-.700)	1.20 (.800-1.60)	2.70 (1.70-5.80)	7.30 (2.50-58.9)	289

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 13-14 are 0.2 and 0.1, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/24D_BiomonitoringSummary.html

Urinary 2,4-Dichlorophenol (creatinine corrected) (2003 – 2010)

CAS Number 120-83-2

Metabolite of other chlorophenols

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	1.02 (.873-1.18)	.880 (.770-1.00)	2.19 (1.84-2.73)	7.39 (5.00-9.83)	15.4 (11.1-20.9)	2522
Total population (2005 - 2006)	.922 (.798-1.06)	.750 (.660-.880)	1.58 (1.33-1.86)	4.00 (3.00-5.71)	8.90 (5.98-16.6)	2548
Total population (2007 - 2008)	.978 (.867-1.10)	.790 (.700-.880)	1.63 (1.36-1.89)	4.00 (3.14-5.63)	11.7 (6.82-18.9)	2604
Total population (2009 - 2010)	.838 (.757-.929)	.680 (.630-.740)	1.33 (1.18-1.58)	3.48 (2.77-4.55)	8.17 (5.44-14.3)	2749
Age 6-11 years (2003 - 2004)	1.23 (.965-1.56)	1.03 (.750-1.45)	2.39 (1.82-3.36)	9.29 (3.98-16.5)	20.9 (12.9-38.1)	314
Age 6-11 years (2005 - 2006)	1.11 (.950-1.29)	.970 (.800-1.08)	1.74 (1.38-2.19)	4.38 (3.33-7.80)	10.9 (5.12-23.3)	356
Age 6-11 years (2007 - 2008)	1.28 (1.00-1.63)	1.06 (.750-1.40)	2.06 (1.44-3.21)	4.49 (3.13-9.27)	11.2 (5.70-24.4)	389
Age 6-11 years (2009 - 2010)	1.27 (.986-1.64)	.930 (.820-1.20)	2.03 (1.54-2.94)	5.89 (3.50-11.0)	15.9 (5.71-121)	415
Age 12-19 years (2003 - 2004)	.954 (.725-1.26)	.790 (.660-1.00)	2.08 (1.44-3.75)	8.02 (4.72-12.5)	14.8 (8.02-40.0)	720
Age 12-19 years (2005 - 2006)	.878 (.765-1.01)	.700 (.600-.800)	1.65 (1.22-1.93)	3.92 (2.90-4.82)	8.28 (4.82-15.9)	702
Age 12-19 years (2007 - 2008)	.927 (.776-1.11)	.790 (.640-1.00)	1.51 (1.14-2.22)	3.81 (2.38-5.92)	10.3 (4.28-21.8)	401
Age 12-19 years (2009 - 2010)	.778 (.656-.921)	.580 (.510-.690)	1.18 (.970-1.40)	3.38 (2.11-6.27)	7.38 (3.39-19.4)	420
Age 20+ years (2003 - 2004)	1.00 (.863-1.16)	.870 (.770-1.00)	2.17 (1.80-2.69)	7.16 (4.88-9.01)	15.0 (10.6-20.8)	1488
Age 20+ years (2005 - 2006)	.909 (.774-1.07)	.740 (.650-.870)	1.55 (1.25-1.89)	4.00 (2.84-6.19)	8.80 (5.71-16.8)	1490
Age 20+ years (2007 - 2008)	.958 (.847-1.08)	.770 (.670-.880)	1.60 (1.32-1.85)	3.98 (3.14-5.59)	12.1 (8.15-18.9)	1814
Age 20+ years (2009 - 2010)	.810 (.735-.892)	.670 (.620-.730)	1.27 (1.11-1.56)	3.33 (2.65-4.23)	7.64 (5.16-12.3)	1914
Males (2003 - 2004)	.995 (.850-1.17)	.900 (.730-1.06)	2.23 (1.82-2.82)	6.84 (4.54-9.01)	13.7 (9.29-21.8)	1230
Males (2005 - 2006)	.927 (.814-1.06)	.770 (.670-.880)	1.60 (1.36-1.86)	4.12 (3.08-5.45)	8.90 (5.19-16.6)	1270
Males (2007 - 2008)	.891 (.808-.984)	.720 (.660-.790)	1.44 (1.29-1.67)	4.00 (2.97-5.30)	9.96 (6.82-13.4)	1294
Males (2009 - 2010)	.788 (.706-.879)	.620 (.580-.660)	1.25 (1.06-1.48)	3.66 (2.52-5.47)	7.69 (4.84-16.9)	1399
Females (2003 - 2004)	1.03 (.845-1.27)	.870 (.770-1.00)	2.17 (1.73-2.73)	8.00 (4.57-12.1)	17.2 (11.1-23.7)	1292
Females (2005 - 2006)	.916 (.770-1.09)	.740 (.640-.880)	1.56 (1.19-1.96)	3.91 (2.66-6.50)	8.93 (5.53-23.7)	1278
Females (2007 - 2008)	1.07 (.910-1.26)	.850 (.720-1.00)	1.75 (1.43-2.29)	4.07 (3.13-7.65)	14.4 (6.50-26.8)	1310
Females (2009 - 2010)	.890 (.789-1.00)	.740 (.660-.850)	1.41 (1.24-1.67)	3.39 (2.76-4.52)	8.79 (5.16-14.8)	1350
Mexican Americans (2003 - 2004)	1.76 (1.30-2.38)	1.33 (1.04-1.74)	3.85 (2.29-8.81)	23.8 (10.6-51.6)	71.4 (30.8-88.8)	616
Mexican Americans (2005 - 2006)	1.77 (1.38-2.27)	1.25 (.990-1.73)	3.79 (2.70-5.35)	16.6 (6.75-31.8)	38.1 (23.8-55.3)	637
Mexican Americans (2007 - 2008)	1.55 (.925-2.60)	1.18 (.630-2.28)	3.33 (1.93-6.50)	14.2 (5.65-30.6)	33.1 (16.6-60.0)	531
Mexican Americans (2009 - 2010)	1.24 (.860-1.78)	.910 (.630-1.28)	2.03 (1.43-3.90)	11.0 (3.54-26.4)	26.4 (10.2-93.5)	566
Non-Hispanic blacks (2003 - 2004)	1.66 (1.28-2.16)	1.47 (1.06-1.96)	4.14 (2.46-7.31)	14.9 (7.93-20.1)	22.9 (16.7-45.0)	635
Non-Hispanic blacks (2005 - 2006)	1.72 (1.39-2.14)	1.32 (1.11-1.56)	3.28 (2.33-5.35)	14.9 (7.40-28.1)	37.0 (15.0-83.4)	678
Non-Hispanic blacks (2007 - 2008)	1.34 (1.14-1.59)	.990 (.800-1.17)	2.36 (1.85-3.12)	13.1 (5.70-23.3)	33.8 (22.7-41.1)	597
Non-Hispanic blacks (2009 - 2010)	1.11 (.739-1.67)	.890 (.630-1.19)	2.07 (1.25-3.87)	8.37 (2.99-22.0)	22.0 (7.05-83.1)	516
Non-Hispanic whites (2003 - 2004)	.864 (.721-1.03)	.780 (.690-.890)	1.86 (1.54-2.23)	5.08 (3.58-8.00)	10.8 (6.84-18.2)	1076
Non-Hispanic whites (2005 - 2006)	.772 (.660-.904)	.670 (.580-.790)	1.25 (1.07-1.56)	2.78 (2.11-3.52)	4.82 (3.33-8.62)	1038
Non-Hispanic whites (2007 - 2008)	.853 (.765-.950)	.730 (.660-.810)	1.36 (1.14-1.67)	2.97 (2.53-3.33)	5.16 (3.84-9.38)	1077
Non-Hispanic whites (2009 - 2010)	.731 (.674-.793)	.630 (.580-.690)	1.13 (1.01-1.25)	2.76 (2.29-3.30)	5.16 (3.79-6.46)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/24D_BiomonitoringSummary.html

Urinary 2,4-Dichlorophenol (creatinine corrected) (2011 – 2014)

CAS Number 120-83-2

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.791 (.706-.886)	.614 (.560-.690)	1.29 (1.08-1.48)	3.33 (2.67-4.57)	8.10 (5.65-11.2)	2487
Total population (2013 - 2014)	.668 (.611-.730)	.556 (.510-.595)	1.13 (1.03-1.29)	2.73 (2.26-3.33)	5.96 (4.41-8.38)	2684
Age 6-11 years (2011 - 2012)	.964 (.807-1.15)	.741 (.620-.851)	1.38 (1.07-1.61)	3.51 (2.22-7.36)	12.4 (5.13-34.9)	395
Age 6-11 years (2013 - 2014)	.977 (.833-1.14)	.800 (.698-.909)	1.52 (1.20-1.94)	3.41 (2.22-6.60)	9.68 (4.48-23.7)	409
Age 12-19 years (2011 - 2012)	.693 (.582-.825)	.545 (.465-.678)	1.15 (.875-1.50)	2.73 (1.96-4.00)	4.82 (3.06-9.75)	388
Age 12-19 years (2013 - 2014)	.542 (.472-.623)	.439 (.385-.519)	.833 (.678-1.13)	1.72 (1.31-3.08)	4.10 (2.45-5.27)	462
Age 20+ years (2011 - 2012)	.790 (.694-.898)	.610 (.556-.675)	1.30 (1.07-1.54)	3.33 (2.55-4.77)	8.33 (5.75-11.3)	1704
Age 20+ years (2013 - 2014)	.661 (.600-.728)	.538 (.495-.588)	1.14 (.991-1.31)	2.77 (2.22-3.47)	5.96 (4.39-8.53)	1813
Males (2011 - 2012)	.670 (.594-.756)	.538 (.462-.609)	1.08 (.903-1.27)	2.89 (2.10-3.46)	5.65 (4.26-7.63)	1258
Males (2013 - 2014)	.595 (.550-.642)	.496 (.455-.538)	1.03 (.906-1.12)	2.41 (2.11-2.77)	4.39 (3.06-7.65)	1284
Females (2011 - 2012)	.928 (.816-1.06)	.714 (.634-.833)	1.45 (1.27-1.76)	4.02 (3.06-6.37)	11.2 (6.37-18.1)	1229
Females (2013 - 2014)	.747 (.667-.836)	.616 (.560-.676)	1.29 (1.11-1.43)	3.29 (2.37-4.15)	7.69 (4.69-12.6)	1400
Mexican Americans (2011 - 2012)	1.01 (.856-1.19)	.788 (.620-1.04)	1.67 (1.50-2.14)	5.94 (3.50-9.36)	14.7 (6.16-33.3)	316
Mexican Americans (2013 - 2014)	.823 (.614-1.10)	.632 (.452-.864)	1.43 (.938-2.29)	6.25 (2.45-12.0)	13.5 (6.32-37.3)	438
Non-Hispanic blacks (2011 - 2012)	.959 (.766-1.20)	.737 (.588-.851)	1.56 (1.18-2.34)	5.26 (3.00-15.0)	19.9 (6.61-40.7)	665
Non-Hispanic blacks (2013 - 2014)	.815 (.617-1.08)	.576 (.500-.704)	1.40 (.952-2.30)	5.32 (2.37-14.7)	15.4 (4.69-51.3)	609
Non-Hispanic whites (2011 - 2012)	.700 (.609-.805)	.563 (.519-.619)	1.08 (.885-1.33)	2.89 (1.79-3.78)	5.75 (3.27-9.67)	811
Non-Hispanic whites (2013 - 2014)	.615 (.557-.679)	.521 (.476-.570)	1.05 (.906-1.24)	2.22 (1.88-2.78)	3.64 (3.01-5.71)	987
All Hispanics (2011 - 2012)	1.10 (.919-1.31)	.870 (.700-1.12)	2.00 (1.54-2.72)	5.70 (3.96-9.26)	14.7 (6.37-43.5)	571
All Hispanics (2013 - 2014)	.780 (.628-.970)	.629 (.508-.774)	1.30 (.980-1.98)	4.48 (3.03-6.81)	11.1 (6.16-23.8)	690
Asians (2011 - 2012)	.832 (.629-1.10)	.667 (.513-.952)	1.42 (1.01-2.12)	3.50 (2.31-7.82)	8.00 (3.50-17.0)	352
Asians (2013 - 2014)	.720 (.540-.961)	.588 (.469-.813)	1.38 (1.06-1.71)	3.51 (1.95-6.78)	7.65 (2.54-54.1)	288

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/24D_BiomonitoringSummary.html

Urinary 2,5-Dichlorophenol (2003 – 2010)

CAS Number 583-78-8

Metabolite of 1,4-Dichlorobenzene (Paradichlorobenzene) and other chlorophenols

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	12.9 (10.1-16.3)	10.5 (8.00-14.2)	40.9 (29.8-54.7)	190 (133-282)	705 (342-1330)	2525
Total population (2005 - 2006)	9.55 (6.67-13.7)	8.10 (5.60-11.5)	26.4 (19.0-36.6)	111 (69.9-166)	332 (175-794)	2548
Total population (2007 - 2008)	9.04 (7.22-11.3)	6.60 (5.50-8.30)	25.7 (19.2-34.7)	131 (90.2-222)	473 (296-753)	2604
Total population (2009 - 2010)	6.10 (4.94-7.53)	4.70 (3.70-5.90)	18.4 (13.3-26.0)	101 (68.0-146)	301 (168-618)	2749
Age 6-11 years (2003 - 2004)	12.5 (8.22-18.9)	9.10 (5.60-17.4)	42.1 (21.7-83.9)	161 (111-626)	928 (249-1640)	314
Age 6-11 years (2005 - 2006)	10.5 (8.29-13.4)	7.80 (5.90-10.6)	28.1 (17.8-40.2)	104 (55.4-226)	336 (189-785)	356
Age 6-11 years (2007 - 2008)	9.31 (6.20-14.0)	6.50 (4.60-10.9)	23.3 (12.2-45.6)	151 (61.1-306)	464 (222-934)	389
Age 6-11 years (2009 - 2010)	7.19 (4.36-11.8)	4.80 (2.70-9.90)	30.4 (12.4-50.7)	146 (63.7-368)	503 (103-4940)	415
Age 12-19 years (2003 - 2004)	16.9 (11.1-26.0)	11.5 (8.20-20.6)	49.9 (26.8-94.0)	233 (94.5-1060)	1080 (287-3970)	722
Age 12-19 years (2005 - 2006)	11.9 (8.47-16.8)	9.60 (6.40-16.7)	36.0 (22.3-54.4)	127 (89.9-160)	459 (160-894)	702
Age 12-19 years (2007 - 2008)	11.3 (8.78-14.5)	7.40 (6.20-9.10)	30.1 (18.5-52.6)	193 (66.7-448)	611 (254-1560)	401
Age 12-19 years (2009 - 2010)	8.01 (5.53-11.6)	4.80 (3.50-8.80)	24.9 (19.1-42.7)	191 (61.2-368)	526 (243-1140)	420
Age 20+ years (2003 - 2004)	12.3 (9.97-15.3)	10.4 (8.00-14.0)	40.5 (30.1-49.2)	181 (141-250)	583 (316-924)	1489
Age 20+ years (2005 - 2006)	9.12 (6.15-13.5)	7.80 (5.20-11.5)	24.9 (17.3-35.3)	110 (62.9-183)	327 (159-852)	1490
Age 20+ years (2007 - 2008)	8.71 (6.83-11.1)	6.60 (5.10-8.70)	24.6 (18.8-34.5)	124 (95.9-186)	452 (286-672)	1814
Age 20+ years (2009 - 2010)	5.75 (4.77-6.92)	4.60 (3.70-5.70)	16.9 (12.7-23.1)	88.4 (66.4-117)	266 (156-450)	1914
Males (2003 - 2004)	14.9 (11.8-18.8)	12.5 (9.00-16.5)	40.5 (30.7-54.5)	152 (120-259)	631 (259-1950)	1231
Males (2005 - 2006)	12.0 (8.55-16.7)	9.90 (7.80-13.8)	29.0 (21.8-40.5)	114 (71.7-200)	396 (175-916)	1270
Males (2007 - 2008)	10.9 (8.86-13.4)	8.30 (6.30-9.90)	29.4 (23.2-39.6)	139 (100-248)	546 (311-727)	1294
Males (2009 - 2010)	7.09 (5.68-8.85)	5.30 (4.40-6.70)	21.9 (15.2-33.5)	103 (63.3-191)	311 (133-736)	1399
Females (2003 - 2004)	11.2 (8.51-14.7)	8.50 (6.30-12.0)	42.8 (26.0-64.2)	212 (141-364)	732 (371-1100)	1294
Females (2005 - 2006)	7.69 (5.17-11.4)	5.90 (3.90-9.40)	21.1 (14.3-35.7)	110 (60.5-183)	317 (141-794)	1278
Females (2007 - 2008)	7.57 (5.70-10.1)	5.50 (4.40-7.30)	20.6 (13.9-31.8)	118 (57.4-268)	442 (213-838)	1310
Females (2009 - 2010)	5.28 (4.17-6.69)	3.90 (3.00-5.10)	16.7 (12.1-22.1)	99.5 (58.2-156)	287 (158-591)	1350
Mexican Americans (2003 - 2004)	30.1 (19.2-47.2)	23.7 (14.7-39.8)	103 (57.4-156)	841 (282-2040)	2370 (2040-3710)	617
Mexican Americans (2005 - 2006)	32.2 (22.2-46.7)	23.0 (14.9-37.1)	120 (69.6-228)	867 (298-1320)	1630 (916-3650)	637
Mexican Americans (2007 - 2008)	22.2 (9.88-49.8)	16.4 (5.40-60.7)	104 (35.2-364)	566 (313-1710)	1920 (672-3460)	531
Mexican Americans (2009 - 2010)	13.0 (5.80-29.1)	10.3 (3.30-26.2)	53.6 (19.4-199)	361 (124-900)	998 (247-3700)	566
Non-Hispanic blacks (2003 - 2004)	54.0 (35.9-81.2)	43.9 (26.2-65.6)	159 (97.0-338)	817 (342-2330)	2330 (887-3730)	636
Non-Hispanic blacks (2005 - 2006)	43.9 (33.2-58.1)	33.2 (25.3-47.6)	161 (79.9-255)	722 (360-1370)	1700 (886-6440)	678
Non-Hispanic blacks (2007 - 2008)	27.4 (21.3-35.2)	18.5 (13.2-26.7)	102 (61.9-147)	682 (364-943)	1490 (933-1870)	597
Non-Hispanic blacks (2009 - 2010)	23.0 (13.0-40.8)	17.3 (8.00-42.7)	82.7 (38.6-168)	443 (119-2180)	1240 (273-4940)	516
Non-Hispanic whites (2003 - 2004)	8.94 (7.15-11.2)	7.80 (6.30-9.40)	25.9 (19.3-36.6)	115 (61.8-171)	255 (148-522)	1077
Non-Hispanic whites (2005 - 2006)	6.19 (4.18-9.17)	5.90 (3.80-9.20)	15.7 (11.4-21.9)	43.7 (31.2-73.1)	105 (62.2-166)	1038
Non-Hispanic whites (2007 - 2008)	6.24 (5.04-7.74)	5.10 (4.20-6.20)	15.4 (12.2-19.9)	49.8 (37.0-90.2)	142 (103-294)	1077
Non-Hispanic whites (2009 - 2010)	4.10 (3.22-5.21)	3.30 (2.60-4.40)	10.9 (8.10-15.5)	45.5 (29.0-82.7)	124 (79.3-215)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.12, 0.2, 0.2, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/25D_BiomonitoringSummary.html

Urinary 2,5-Dichlorophenol (2011 – 2014)

CAS Number 583-78-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	4.21 (3.15-5.62)	3.10 (2.30-3.90)	13.4 (9.40-18.9)	69.9 (40.9-117)	213 (121-404)	2489
Total population (2013 - 2014)	2.78 (2.15-3.59)	1.80 (1.40-2.50)	7.50 (5.30-11.4)	37.7 (23.8-58.0)	148 (78.4-266)	2686
Age 6-11 years (2011 - 2012)	3.45 (2.11-5.64)	2.30 (1.60-3.30)	9.20 (4.40-21.2)	69.1 (27.8-168)	369 (99.9-986)	396
Age 6-11 years (2013 - 2014)	2.90 (1.98-4.24)	2.00 (1.30-3.00)	8.20 (4.30-14.9)	29.6 (19.7-73.8)	123 (38.0-438)	409
Age 12-19 years (2011 - 2012)	4.15 (2.43-7.10)	3.20 (1.60-8.00)	14.0 (7.30-28.8)	55.7 (28.6-209)	236 (71.2-468)	388
Age 12-19 years (2013 - 2014)	2.72 (1.75-4.24)	2.10 (1.30-3.30)	6.00 (3.80-14.0)	21.7 (10.6-77.7)	77.7 (21.7-315)	462
Age 20+ years (2011 - 2012)	4.31 (3.21-5.78)	3.20 (2.30-4.10)	14.2 (9.40-19.2)	71.4 (39.5-118)	198 (118-408)	1705
Age 20+ years (2013 - 2014)	2.78 (2.20-3.51)	1.80 (1.40-2.40)	7.80 (5.50-11.5)	42.7 (25.2-61.2)	169 (87.2-308)	1815
Males (2011 - 2012)	4.42 (3.38-5.78)	3.30 (2.40-4.50)	13.2 (9.40-20.8)	55.5 (37.1-106)	194 (99.8-341)	1259
Males (2013 - 2014)	2.96 (2.31-3.80)	2.00 (1.50-2.60)	7.20 (5.20-11.5)	36.1 (23.1-52.6)	175 (77.6-250)	1285
Females (2011 - 2012)	4.01 (2.86-5.61)	2.80 (2.00-3.70)	13.9 (9.20-17.7)	83.3 (42.4-124)	352 (117-614)	1230
Females (2013 - 2014)	2.61 (1.96-3.48)	1.70 (1.30-2.50)	7.80 (5.20-11.9)	38.3 (21.6-63.8)	136 (63.2-376)	1401
Mexican Americans (2011 - 2012)	5.92 (3.36-10.4)	4.00 (2.20-8.40)	21.2 (14.2-42.7)	178 (58.4-341)	362 (119-1130)	316
Mexican Americans (2013 - 2014)	4.60 (2.78-7.61)	2.70 (1.40-6.30)	14.5 (6.70-29.2)	90.5 (32.9-486)	584 (85.3-1840)	438
Non-Hispanic blacks (2011 - 2012)	16.6 (10.4-26.2)	13.4 (8.80-19.4)	47.9 (24.9-100)	227 (108-569)	759 (341-2480)	665
Non-Hispanic blacks (2013 - 2014)	9.58 (5.03-18.2)	7.20 (3.90-14.2)	27.6 (15.6-70.7)	175 (51.4-874)	843 (150-3710)	609
Non-Hispanic whites (2011 - 2012)	2.78 (2.13-3.63)	2.00 (1.60-2.50)	7.40 (5.40-9.70)	34.4 (18.1-67.6)	112 (52.1-178)	813
Non-Hispanic whites (2013 - 2014)	1.95 (1.54-2.46)	1.40 (1.10-1.90)	4.70 (3.30-6.50)	19.0 (12.8-25.9)	53.7 (25.2-131)	988
All Hispanics (2011 - 2012)	7.96 (4.50-14.1)	6.30 (3.20-14.9)	29.1 (16.0-66.7)	196 (84.1-399)	536 (194-1630)	571
All Hispanics (2013 - 2014)	4.26 (2.84-6.40)	2.80 (1.50-5.00)	11.8 (7.20-22.4)	77.7 (42.7-236)	420 (112-807)	690
Asians (2011 - 2012)	3.77 (2.17-6.53)	2.40 (1.40-5.40)	13.0 (5.40-43.4)	86.8 (38.6-160)	378 (86.8-810)	352
Asians (2013 - 2014)	2.66 (1.64-4.32)	1.70 (1.20-2.90)	6.20 (3.30-18.5)	50.3 (13.0-154)	154 (38.7-2450)	289

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 and 13-14 are 0.2 and 0.1, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/25D_BiomonitoringSummary.html

Urinary 2,5-Dichlorophenol (creatinine corrected) (2003 – 2010)

CAS Number 583-78-8

Metabolite of 1,4-Dichlorobenzene (Paradichlorobenzene) and other chlorophenols

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	12.5 (10.1-15.6)	9.29 (7.25-12.5)	34.4 (26.8-45.4)	141 (100-251)	578 (313-851)	2522
Total population (2005 - 2006)	9.31 (6.70-12.9)	7.32 (5.33-10.2)	20.4 (14.8-30.5)	89.3 (54.9-176)	292 (176-640)	2548
Total population (2007 - 2008)	9.12 (7.35-11.3)	6.24 (5.00-7.77)	24.2 (17.2-30.3)	109 (70.8-175)	409 (234-745)	2604
Total population (2009 - 2010)	6.36 (5.07-7.99)	4.12 (3.31-5.16)	16.2 (11.7-22.8)	80.2 (59.5-127)	269 (144-505)	2749
Age 6-11 years (2003 - 2004)	15.2 (9.93-23.1)	10.6 (5.87-26.7)	44.7 (28.9-80.0)	183 (95.3-617)	830 (330-2150)	314
Age 6-11 years (2005 - 2006)	11.6 (8.90-15.1)	8.00 (5.95-12.6)	24.7 (16.8-37.8)	129 (55.8-242)	419 (151-709)	356
Age 6-11 years (2007 - 2008)	11.5 (7.95-16.5)	7.70 (5.41-11.7)	29.5 (19.6-50.9)	131 (59.9-239)	420 (170-1110)	389
Age 6-11 years (2009 - 2010)	9.36 (5.65-15.5)	6.25 (4.09-9.60)	33.9 (12.6-65.0)	177 (66.1-496)	536 (111-5950)	415
Age 12-19 years (2003 - 2004)	12.7 (8.50-18.9)	9.05 (6.17-13.3)	34.8 (18.6-67.0)	177 (67.0-516)	549 (187-2120)	720
Age 12-19 years (2005 - 2006)	8.88 (6.34-12.4)	6.91 (4.15-11.1)	23.4 (17.7-30.0)	78.0 (58.5-112)	279 (112-659)	702
Age 12-19 years (2007 - 2008)	8.79 (6.81-11.4)	5.56 (4.42-7.50)	20.9 (13.8-34.9)	130 (41.8-251)	353 (158-799)	401
Age 12-19 years (2009 - 2010)	6.44 (4.40-9.42)	4.05 (2.34-8.69)	19.4 (11.6-37.7)	121 (49.3-218)	257 (119-1180)	420
Age 20+ years (2003 - 2004)	12.2 (10.1-14.8)	9.13 (7.25-12.4)	32.7 (26.7-42.9)	140 (103-203)	552 (283-838)	1488
Age 20+ years (2005 - 2006)	9.15 (6.43-13.0)	7.29 (5.29-10.0)	19.6 (14.2-30.4)	90.7 (48.5-197)	274 (163-701)	1490
Age 20+ years (2007 - 2008)	8.94 (7.07-11.3)	6.15 (4.93-8.00)	24.3 (16.6-30.6)	101 (70.0-162)	422 (234-729)	1814
Age 20+ years (2009 - 2010)	6.09 (4.97-7.45)	3.97 (3.27-4.78)	14.7 (11.0-20.5)	72.5 (56.6-97.2)	261 (141-446)	1914
Males (2003 - 2004)	12.2 (9.73-15.3)	9.65 (7.23-12.7)	32.7 (25.3-39.1)	108 (79.0-183)	358 (161-1080)	1230
Males (2005 - 2006)	9.60 (7.17-12.9)	8.11 (5.95-10.5)	20.5 (15.9-28.2)	74.9 (50.5-141)	249 (137-534)	1270
Males (2007 - 2008)	9.17 (7.63-11.0)	6.24 (5.22-7.81)	25.5 (19.7-32.4)	110 (70.7-167)	353 (234-572)	1294
Males (2009 - 2010)	6.36 (5.04-8.02)	4.21 (3.36-4.97)	16.7 (11.7-24.0)	83.2 (53.7-141)	280 (111-727)	1399
Females (2003 - 2004)	12.9 (9.91-16.8)	8.95 (6.98-13.2)	37.1 (26.7-56.9)	209 (124-362)	660 (408-940)	1292
Females (2005 - 2006)	9.04 (6.18-13.2)	6.60 (4.56-10.4)	20.4 (14.1-33.8)	104 (55.8-199)	309 (149-933)	1278
Females (2007 - 2008)	9.07 (6.91-11.9)	6.08 (4.71-8.04)	22.4 (14.7-30.6)	107 (59.2-216)	509 (185-908)	1310
Females (2009 - 2010)	6.37 (4.92-8.25)	4.10 (3.09-5.69)	15.6 (11.3-22.1)	77.1 (53.3-148)	267 (151-481)	1350
Mexican Americans (2003 - 2004)	27.3 (17.4-42.9)	17.8 (9.86-36.3)	79.8 (45.8-138)	809 (196-2110)	2200 (1250-2480)	616
Mexican Americans (2005 - 2006)	29.0 (20.5-41.0)	18.6 (12.9-27.3)	99.4 (61.6-165)	675 (296-1400)	1680 (718-2720)	637
Mexican Americans (2007 - 2008)	21.6 (9.44-49.6)	16.4 (5.09-58.9)	83.9 (30.8-281)	572 (182-1490)	1490 (700-2220)	531
Mexican Americans (2009 - 2010)	12.9 (5.78-28.8)	9.12 (3.38-26.7)	45.0 (17.3-236)	460 (105-1000)	1000 (380-2800)	566
Non-Hispanic blacks (2003 - 2004)	37.1 (24.3-56.7)	27.4 (17.5-47.7)	103 (63.8-216)	609 (248-1210)	1240 (627-2430)	635
Non-Hispanic blacks (2005 - 2006)	30.9 (23.6-40.3)	20.5 (17.3-29.1)	104 (57.7-180)	480 (294-1080)	1480 (515-3100)	678
Non-Hispanic blacks (2007 - 2008)	21.3 (16.2-27.9)	14.6 (10.2-19.7)	64.6 (48.0-101)	529 (217-884)	1130 (793-1560)	597
Non-Hispanic blacks (2009 - 2010)	16.7 (9.19-30.2)	12.5 (6.74-22.0)	58.9 (22.3-106)	349 (92.6-878)	878 (277-3890)	516
Non-Hispanic whites (2003 - 2004)	9.24 (7.48-11.4)	7.14 (5.67-8.76)	24.8 (18.7-31.7)	79.7 (50.2-141)	216 (124-516)	1076
Non-Hispanic whites (2005 - 2006)	6.52 (4.51-9.43)	5.60 (3.86-8.51)	14.1 (10.7-19.7)	40.2 (28.4-61.6)	110 (47.3-224)	1038
Non-Hispanic whites (2007 - 2008)	6.52 (5.26-8.07)	4.89 (3.95-6.20)	14.4 (11.4-19.2)	53.2 (40.1-75.9)	131 (82.5-249)	1077
Non-Hispanic whites (2009 - 2010)	4.60 (3.59-5.90)	3.27 (2.77-4.10)	10.4 (7.22-15.2)	41.3 (25.0-69.1)	130 (73.4-180)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/25D_BiomonitoringSummary.html

Urinary 2,5-Dichlorophenol (creatinine corrected) (2011 – 2014)

CAS Number 583-78-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	4.80 (3.65-6.32)	3.19 (2.38-4.43)	11.4 (7.97-17.9)	66.4 (39.9-125)	215 (145-342)	2487
Total population (2013 - 2014)	2.77 (2.12-3.62)	1.82 (1.43-2.40)	6.80 (4.62-9.72)	32.2 (21.9-45.5)	108 (58.4-270)	2684
Age 6-11 years (2011 - 2012)	5.01 (3.10-8.09)	3.02 (2.00-5.00)	10.6 (5.53-21.7)	98.1 (32.9-166)	377 (125-1180)	395
Age 6-11 years (2013 - 2014)	3.66 (2.50-5.36)	2.41 (1.62-3.54)	9.73 (5.25-15.6)	37.6 (16.9-110)	172 (70.4-615)	409
Age 12-19 years (2011 - 2012)	4.04 (2.51-6.52)	2.41 (1.54-5.34)	12.1 (5.67-27.6)	47.9 (26.3-99.5)	157 (55.1-324)	388
Age 12-19 years (2013 - 2014)	2.21 (1.44-3.40)	1.53 (0.915-2.52)	5.16 (2.63-12.0)	22.7 (12.2-38.9)	54.2 (21.7-236)	462
Age 20+ years (2011 - 2012)	4.90 (3.67-6.56)	3.33 (2.50-4.51)	11.5 (8.04-18.0)	70.3 (38.8-136)	226 (145-342)	1704
Age 20+ years (2013 - 2014)	2.78 (2.15-3.59)	1.81 (1.44-2.29)	6.67 (4.62-9.47)	32.6 (21.1-51.0)	126 (58.4-325)	1813
Males (2011 - 2012)	4.15 (3.14-5.49)	2.87 (2.14-4.13)	9.73 (6.88-16.1)	52.8 (31.4-106)	157 (125-233)	1258
Males (2013 - 2014)	2.49 (1.93-3.22)	1.69 (1.23-2.22)	5.49 (4.18-8.11)	27.4 (19.6-45.8)	88.7 (58.4-160)	1284
Females (2011 - 2012)	5.53 (4.14-7.37)	3.39 (2.57-5.00)	13.1 (8.84-19.5)	90.1 (45.2-147)	331 (145-557)	1229
Females (2013 - 2014)	3.07 (2.30-4.09)	1.96 (1.52-2.54)	8.22 (5.07-11.9)	33.8 (21.7-56.2)	140 (50.4-374)	1400
Mexican Americans (2011 - 2012)	6.67 (4.04-11.0)	4.85 (2.25-8.69)	22.4 (12.6-37.6)	189 (49.2-249)	383 (213-981)	316
Mexican Americans (2013 - 2014)	4.68 (2.72-8.06)	2.47 (1.36-5.71)	14.5 (7.24-25.0)	91.8 (26.9-559)	559 (89.0-1330)	438
Non-Hispanic blacks (2011 - 2012)	12.9 (8.32-19.9)	9.41 (6.35-15.1)	34.5 (18.1-75.0)	174 (83.7-567)	744 (236-1790)	665
Non-Hispanic blacks (2013 - 2014)	7.07 (3.87-12.9)	5.62 (2.55-10.4)	21.2 (10.0-54.1)	128 (32.7-527)	415 (103-2580)	609
Non-Hispanic whites (2011 - 2012)	3.40 (2.57-4.49)	2.36 (1.76-3.19)	6.96 (4.70-9.67)	34.5 (16.4-80.1)	126 (55.3-232)	811
Non-Hispanic whites (2013 - 2014)	2.03 (1.53-2.69)	1.48 (1.13-1.91)	4.15 (2.96-6.34)	18.2 (10.6-32.5)	45.8 (26.0-86.3)	987
All Hispanics (2011 - 2012)	8.92 (5.45-14.6)	6.55 (3.50-13.8)	28.8 (16.6-53.6)	184 (97.2-266)	383 (213-1240)	571
All Hispanics (2013 - 2014)	4.23 (2.77-6.47)	2.50 (1.41-5.07)	11.5 (6.84-18.7)	84.6 (32.2-226)	401 (135-993)	690
Asians (2011 - 2012)	5.05 (2.93-8.69)	2.99 (1.74-7.04)	15.3 (6.51-45.6)	106 (58.7-177)	236 (97.5-632)	352
Asians (2013 - 2014)	3.40 (2.10-5.52)	2.06 (1.33-3.26)	8.99 (3.21-20.8)	45.2 (17.3-158)	207 (32.6-3020)	288

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/25D_BiomonitoringSummary.html

Urinary Bis(1-chloro-2-propyl) phosphate (BCPP) (2013 – 2014)

CAS Number 789440-10-4

Metabolite of Tris(1-chloro-2-propyl) phosphate (TCPP)

Geometric mean and selected percentiles of concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.188 (.174-.202)	.160 (.140-.180)	.380 (.330-.410)	.790 (.690-.880)	1.25 (1.07-1.48)	2665
Age 6-11 years (2013 - 2014)	.267 (.227-.314)	.250 (.200-.300)	.490 (.400-.590)	1.08 (.630-1.98)	2.12 (1.28-4.21)	421
Age 12-19 years (2013 - 2014)	.190 (.164-.220)	.160 (.130-.220)	.410 (.290-.520)	.670 (.600-.790)	1.04 (.700-1.31)	427
Age 20+ years (2013 - 2014)	*	.150 (.130-.170)	.350 (.310-.390)	.760 (.690-.860)	1.25 (1.05-1.55)	1817
Males (2013 - 2014)	.199 (.183-.217)	.170 (.140-.200)	.420 (.360-.480)	.880 (.760-.980)	1.34 (1.17-1.67)	1344
Females (2013 - 2014)	*	.150 (.130-.180)	.340 (.280-.390)	.700 (.560-.830)	1.11 (.870-1.52)	1321
Mexican Americans (2013 - 2014)	*	.130 (<LOD-.160)	.320 (.290-.380)	.660 (.510-.910)	1.11 (.780-1.50)	428
Non-Hispanic blacks (2013 - 2014)	.190 (.171-.212)	.170 (.150-.200)	.340 (.310-.390)	.690 (.580-.820)	1.01 (.820-1.23)	587
Non-Hispanic whites (2013 - 2014)	.189 (.172-.208)	.150 (.130-.180)	.380 (.330-.450)	.820 (.700-.990)	1.31 (1.07-1.73)	1014
All Hispanics (2013 - 2014)	*	.150 (.110-.180)	.320 (.310-.360)	.660 (.550-.780)	1.11 (.860-1.50)	671
Asians (2013 - 2014)	*	.170 (.120-.210)	.400 (.310-.540)	.770 (.660-1.08)	1.30 (.850-2.26)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Bis(1-chloro-2-propyl) phosphate (BCPP) (creatinine corrected) (2013 – 2014)

CAS Number 789440-10-4

Metabolite of Tris(1-chloro-2-propyl) phosphate (TCPP)

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.200 (.184-.218)	.187 (.173-.201)	.347 (.313-.375)	.701 (.619-.787)	1.21 (1.03-1.49)	2663
Age 6-11 years (2013 - 2014)	.344 (.296-.399)	.349 (.292-.381)	.568 (.500-.701)	1.37 (.953-2.13)	2.41 (1.26-3.30)	421
Age 12-19 years (2013 - 2014)	.162 (.135-.194)	.159 (.130-.191)	.314 (.226-.384)	.500 (.416-.667)	.753 (.500-1.26)	427
Age 20+ years (2013 - 2014)	*	.184 (.168-.196)	.320 (.284-.365)	.665 (.571-.769)	1.17 (.936-1.50)	1815
Males (2013 - 2014)	.182 (.165-.201)	.167 (.152-.179)	.333 (.284-.382)	.722 (.610-.842)	1.21 (1.00-1.56)	1343
Females (2013 - 2014)	*	.210 (.187-.233)	.352 (.316-.390)	.688 (.560-.847)	1.26 (.921-1.53)	1320
Mexican Americans (2013 - 2014)	*	.153 (<LOD-.189)	.318 (.259-.350)	.517 (.412-.739)	.918 (.556-1.27)	426
Non-Hispanic blacks (2013 - 2014)	.146 (.124-.172)	.144 (.116-.163)	.250 (.229-.292)	.459 (.391-.550)	.727 (.574-.890)	587
Non-Hispanic whites (2013 - 2014)	.214 (.195-.235)	.198 (.179-.219)	.358 (.318-.389)	.777 (.644-.965)	1.49 (1.04-1.80)	1014
All Hispanics (2013 - 2014)	*	.171 (.153-.189)	.333 (.305-.350)	.556 (.470-.735)	.977 (.638-1.23)	669
Asians (2013 - 2014)	*	.241 (.212-.266)	.447 (.359-.547)	.750 (.621-.944)	1.26 (.820-1.66)	291

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Bis(2-chloroethyl) phosphate (BCEtP) (2013 – 2014)

CAS Number 3040-56-0

Metabolite of Tris(2-chloroethyl) phosphate (TCEtP)

Geometric mean and selected percentiles of concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.419 (.376-.466)	.390 (.350-.420)	.950 (.840-1.12)	2.31 (1.90-2.82)	3.94 (3.08-5.17)	2651
Age 6-11 years (2013 - 2014)	.662 (.545-.804)	.660 (.500-.850)	1.50 (1.05-1.77)	2.91 (1.77-5.63)	5.63 (2.99-7.34)	418
Age 12-19 years (2013 - 2014)	.602 (.508-.713)	.570 (.450-.730)	1.47 (.950-2.21)	3.18 (2.57-3.80)	4.24 (3.76-6.40)	423
Age 20+ years (2013 - 2014)	.378 (.339-.421)	.350 (.310-.390)	.850 (.740-.960)	2.06 (1.69-2.64)	3.55 (2.76-5.17)	1810
Males (2013 - 2014)	.458 (.401-.523)	.420 (.390-.470)	1.03 (.890-1.28)	2.46 (1.85-3.07)	4.00 (3.00-6.92)	1337
Females (2013 - 2014)	.384 (.335-.439)	.350 (.310-.390)	.850 (.740-1.03)	2.28 (1.90-2.75)	3.90 (2.98-4.64)	1314
Mexican Americans (2013 - 2014)	.502 (.397-.636)	.500 (.370-.660)	1.14 (.710-1.88)	2.70 (1.69-4.00)	4.47 (3.30-7.73)	428
Non-Hispanic blacks (2013 - 2014)	.483 (.431-.541)	.400 (.380-.480)	1.03 (.820-1.26)	2.41 (1.95-2.88)	4.26 (2.84-5.60)	578
Non-Hispanic whites (2013 - 2014)	.394 (.352-.441)	.360 (.310-.400)	.910 (.820-1.09)	2.28 (1.85-2.75)	3.73 (2.82-5.41)	1012
All Hispanics (2013 - 2014)	.478 (.398-.575)	.470 (.390-.570)	1.06 (.770-1.52)	2.38 (1.71-3.50)	4.00 (3.01-5.35)	668
Asians (2013 - 2014)	.375 (.316-.445)	.340 (.270-.400)	.770 (.620-1.14)	2.26 (1.32-3.55)	4.68 (2.79-6.93)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.08.

Urinary Bis(2-chloroethyl) phosphate (BCEtP) (creatinine corrected) (2013 – 2014)

CAS Number 3040-56-0

Metabolite of Tris(2-chloroethyl) phosphate (TCEtP)

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.447 (.396-.505)	.388 (.337-.444)	.856 (.743-.981)	2.03 (1.72-2.38)	3.94 (2.74-5.13)	2649
Age 6-11 years (2013 - 2014)	.855 (.720-1.02)	.833 (.676-.981)	1.60 (1.18-2.12)	4.25 (3.39-5.43)	6.83 (4.97-8.99)	418
Age 12-19 years (2013 - 2014)	.516 (.429-.620)	.442 (.350-.568)	1.06 (.768-1.38)	2.33 (1.70-3.03)	4.48 (2.42-6.77)	423
Age 20+ years (2013 - 2014)	.408 (.362-.460)	.349 (.313-.393)	.742 (.632-.875)	1.87 (1.42-2.31)	3.12 (2.38-4.69)	1808
Males (2013 - 2014)	.420 (.370-.476)	.373 (.322-.406)	.826 (.725-.954)	2.01 (1.50-2.43)	3.70 (2.44-5.50)	1336
Females (2013 - 2014)	.476 (.417-.543)	.407 (.350-.467)	.909 (.742-1.04)	2.06 (1.75-2.41)	3.99 (2.61-5.26)	1313
Mexican Americans (2013 - 2014)	.515 (.394-.672)	.477 (.343-.637)	1.01 (.665-1.47)	2.35 (1.57-3.03)	3.19 (2.43-6.34)	426
Non-Hispanic blacks (2013 - 2014)	.374 (.321-.435)	.328 (.267-.450)	.732 (.630-.867)	1.56 (1.18-1.80)	2.41 (1.86-3.17)	578
Non-Hispanic whites (2013 - 2014)	.446 (.393-.506)	.379 (.333-.437)	.857 (.731-1.00)	2.03 (1.64-2.44)	4.68 (2.51-5.58)	1012
All Hispanics (2013 - 2014)	.495 (.406-.604)	.472 (.371-.585)	.980 (.736-1.36)	2.27 (1.69-2.75)	3.14 (2.53-3.94)	666
Asians (2013 - 2014)	.477 (.412-.553)	.442 (.371-.500)	.792 (.606-1.28)	2.33 (1.51-3.46)	4.18 (2.76-9.34)	291

Urinary Bis(1,3-dichloro-2-propyl) phosphate (BDCPP) (2013 – 2014)

CAS Number 72236-72-7

Metabolite of Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)

Geometric mean and selected percentiles of concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.856 (.750-.976)	.880 (.790-.970)	2.21 (1.90-2.57)	4.77 (3.88-5.77)	7.23 (6.07-8.60)	2646
Age 6-11 years (2013 - 2014)	2.25 (1.82-2.77)	2.31 (1.62-2.86)	5.40 (3.69-7.33)	11.3 (7.39-14.9)	14.9 (10.8-25.4)	421
Age 12-19 years (2013 - 2014)	1.34 (1.13-1.59)	1.43 (1.23-1.74)	3.08 (2.39-3.99)	5.58 (4.02-8.18)	8.61 (5.58-9.87)	427
Age 20+ years (2013 - 2014)	.720 (.633-.818)	.710 (.630-.830)	1.84 (1.62-2.09)	3.96 (3.14-4.75)	6.29 (4.93-7.16)	1798
Males (2013 - 2014)	.914 (.802-1.04)	.940 (.830-1.06)	2.20 (1.87-2.59)	4.49 (3.47-5.75)	7.15 (5.18-9.41)	1331
Females (2013 - 2014)	.803 (.679-.949)	.820 (.690-.960)	2.25 (1.81-2.60)	5.09 (3.98-6.30)	7.48 (6.17-8.83)	1315
Mexican Americans (2013 - 2014)	1.08 (.904-1.28)	1.16 (.900-1.54)	2.51 (1.87-3.11)	5.09 (3.63-7.48)	8.19 (5.50-11.3)	423
Non-Hispanic blacks (2013 - 2014)	.975 (.873-1.09)	.960 (.860-1.12)	2.16 (1.86-2.54)	4.23 (3.43-4.94)	6.18 (5.08-7.02)	585
Non-Hispanic whites (2013 - 2014)	.833 (.708-.980)	.850 (.710-.990)	2.26 (1.93-2.66)	4.93 (3.98-6.44)	7.42 (6.76-8.83)	1005
All Hispanics (2013 - 2014)	.977 (.840-1.14)	1.02 (.850-1.22)	2.20 (1.76-2.61)	4.39 (3.30-5.43)	7.39 (4.83-9.07)	665
Asians (2013 - 2014)	.508 (.438-.589)	.480 (.390-.610)	1.19 (.900-1.49)	3.19 (1.93-4.33)	4.62 (3.61-9.06)	289

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.11.

Urinary Bis(1,3-dichloro-2-propyl) phosphate (BDCPP) (creatinine corrected) (2013 – 2014)

CAS Number 72236-72-7

Metabolite of Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.913 (.795-1.05)	.874 (.746-1.03)	1.90 (1.58-2.22)	3.72 (2.88-4.97)	6.30 (4.77-7.93)	2644
Age 6-11 years (2013 - 2014)	2.89 (2.38-3.51)	2.81 (2.28-3.66)	6.10 (4.42-7.98)	11.0 (8.41-14.3)	14.8 (11.2-21.1)	421
Age 12-19 years (2013 - 2014)	1.14 (.931-1.40)	1.10 (.887-1.45)	2.20 (1.75-2.57)	4.26 (2.75-6.46)	6.82 (3.43-10.5)	427
Age 20+ years (2013 - 2014)	.777 (.682-.886)	.734 (.627-.875)	1.55 (1.37-1.77)	2.85 (2.38-3.57)	4.29 (3.29-5.29)	1796
Males (2013 - 2014)	.837 (.723-.968)	.825 (.696-.964)	1.69 (1.41-2.05)	3.07 (2.53-4.30)	4.97 (3.71-6.96)	1330
Females (2013 - 2014)	.993 (.853-1.16)	.917 (.750-1.15)	2.07 (1.74-2.48)	4.26 (3.18-5.63)	7.02 (5.23-8.90)	1314
Mexican Americans (2013 - 2014)	1.11 (.905-1.36)	1.08 (.865-1.32)	2.15 (1.62-2.86)	4.16 (3.13-5.91)	6.38 (4.69-8.48)	421
Non-Hispanic blacks (2013 - 2014)	.750 (.674-.834)	.731 (.630-.842)	1.44 (1.29-1.60)	2.81 (2.21-3.54)	4.27 (3.38-5.80)	585
Non-Hispanic whites (2013 - 2014)	.943 (.806-1.10)	.896 (.708-1.09)	2.00 (1.68-2.43)	3.94 (3.00-5.11)	6.77 (5.00-9.20)	1005
All Hispanics (2013 - 2014)	1.01 (.862-1.19)	.977 (.833-1.19)	1.92 (1.62-2.23)	3.97 (2.87-4.69)	5.80 (4.19-7.84)	663
Asians (2013 - 2014)	.648 (.554-.758)	.582 (.515-.727)	1.30 (1.01-1.62)	2.59 (1.88-4.70)	4.99 (2.78-6.91)	289

Urinary Dibenzyl phosphate (DBzP) (2013 – 2014)

CAS Number 1623-08-1

Metabolite of Tribenzyl phosphate (TBzP)

Geometric mean and selected percentiles of concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2665
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	421
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	427
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1817
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1344
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1321
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	428
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	587
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1014
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	671
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	291

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.05.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Dibenzyl phosphate (DBzP) (creatinine corrected) (2013 – 2014)

CAS Number 1623-08-1

Metabolite of Tribenzyl phosphate (TBzP)

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2663
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	421
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	427
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1815
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1320
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	426
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	587
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1014
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	669
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	291

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Dibutyl phosphate (DBuP) (2013 – 2014)

CAS Number 107-66-4

Metabolite of Tri-n-butyl phosphate (TBP)

Geometric mean and selected percentiles of concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.188 (.162-.217)	.250 (.220-.280)	.370 (.350-.400)	.520 (.490-.570)	.670 (.610-.750)	2663
Age 6-11 years (2013 - 2014)	.272 (.203-.365)	.340 (.270-.390)	.490 (.450-.590)	.790 (.660-.980)	1.10 (.740-5.23)	421
Age 12-19 years (2013 - 2014)	.207 (.175-.244)	.270 (.240-.320)	.390 (.340-.440)	.570 (.450-.750)	.790 (.600-1.19)	427
Age 20+ years (2013 - 2014)	.177 (.153-.206)	.230 (.200-.270)	.350 (.330-.380)	.500 (.460-.530)	.600 (.570-.650)	1815
Males (2013 - 2014)	.191 (.166-.221)	.260 (.220-.290)	.380 (.350-.410)	.530 (.500-.570)	.670 (.590-.850)	1342
Females (2013 - 2014)	.184 (.157-.216)	.240 (.210-.270)	.360 (.330-.400)	.510 (.460-.580)	.670 (.590-.790)	1321
Mexican Americans (2013 - 2014)	.187 (.145-.239)	.240 (.160-.310)	.370 (.330-.410)	.520 (.470-.590)	.700 (.570-.870)	428
Non-Hispanic blacks (2013 - 2014)	.235 (.206-.268)	.300 (.280-.320)	.420 (.370-.460)	.610 (.520-.740)	.810 (.690-.980)	587
Non-Hispanic whites (2013 - 2014)	.189 (.161-.222)	.250 (.210-.280)	.370 (.340-.400)	.510 (.480-.570)	.640 (.590-.740)	1012
All Hispanics (2013 - 2014)	.185 (.151-.228)	.230 (.190-.280)	.360 (.330-.420)	.510 (.450-.590)	.700 (.570-.870)	671
Asians (2013 - 2014)	.106 (.091-.124)	.080 (.060-.130)	.260 (.200-.310)	.380 (.340-.470)	.510 (.400-.680)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.05.

Urinary Dibutyl phosphate (DBuP) (creatinine corrected) (2013 – 2014)

CAS Number 107-66-4

Metabolite of Tri-*n*-butyl phosphate (TBP)

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.200 (.171-.234)	.215 (.186-.246)	.357 (.321-.393)	.545 (.500-.583)	.719 (.612-.813)	2661
Age 6-11 years (2013 - 2014)	.350 (.266-.461)	.373 (.304-.435)	.543 (.484-.660)	.909 (.682-1.47)	1.47 (.875-4.17)	421
Age 12-19 years (2013 - 2014)	.177 (.152-.205)	.191 (.157-.223)	.286 (.256-.326)	.440 (.373-.548)	.566 (.481-.619)	427
Age 20+ years (2013 - 2014)	.192 (.163-.225)	.209 (.180-.239)	.342 (.311-.376)	.526 (.473-.565)	.651 (.570-.762)	1813
Males (2013 - 2014)	.175 (.151-.204)	.192 (.159-.227)	.308 (.278-.342)	.479 (.415-.515)	.582 (.543-.619)	1341
Females (2013 - 2014)	.227 (.191-.271)	.238 (.205-.286)	.407 (.361-.444)	.585 (.542-.704)	.763 (.696-.892)	1320
Mexican Americans (2013 - 2014)	.191 (.152-.239)	.203 (.161-.256)	.324 (.279-.383)	.526 (.436-.581)	.651 (.533-.865)	426
Non-Hispanic blacks (2013 - 2014)	.181 (.157-.208)	.194 (.167-.217)	.323 (.269-.375)	.473 (.424-.519)	.609 (.519-.734)	587
Non-Hispanic whites (2013 - 2014)	.214 (.179-.257)	.234 (.196-.265)	.378 (.333-.417)	.561 (.521-.617)	.762 (.617-.893)	1012
All Hispanics (2013 - 2014)	.191 (.158-.231)	.200 (.174-.246)	.323 (.281-.370)	.518 (.441-.571)	.651 (.554-.864)	669
Asians (2013 - 2014)	.135 (.113-.161)	.138 (.116-.162)	.265 (.212-.333)	.487 (.337-.583)	.588 (.508-.674)	291

Urinary Di-o-cresylphosphate (DoCP) (2013 – 2014)

CAS Number 35787-74-7

Metabolite of Tri-o-cresylphosphate (ToCP)

Geometric mean and selected percentiles of concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2665
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	421
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	427
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1817
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1344
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1321
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	428
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	587
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1014
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	671
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	291

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.05.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Di-o-cresylphosphate (DoCP) (creatinine corrected) (2013 – 2014)

CAS Number 35787-74-7

Metabolite of Tri-o-cresylphosphate (ToCP)

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2663
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	421
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	427
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1815
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1320
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	426
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	587
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1014
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	669
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	291

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Di-p-cresylphosphate (DpCP) (2013 – 2014)

CAS Number 843-24-3

Metabolite of Tri-p-cresylphosphate (TpCP)

Geometric mean and selected percentiles of concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	.070 (.060-.080)	.110 (.090-.160)	2664
Age 6-11 years (2013 - 2014)	*	< LOD	.060 (<LOD-.080)	.150 (.090-.210)	.240 (.160-.490)	421
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.090 (.060-.130)	.140 (.080-.270)	427
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.050 (<LOD-.070)	.090 (.080-.130)	1816
Males (2013 - 2014)	*	< LOD	< LOD	.070 (.050-.090)	.130 (.100-.200)	1344
Females (2013 - 2014)	*	< LOD	< LOD	.070 (.050-.080)	.100 (.080-.140)	1320
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.060 (<LOD-.090)	.130 (.070-.230)	428
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.060 (<LOD-.080)	.100 (.080-.160)	587
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.070 (.060-.090)	.130 (.090-.190)	1014
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.060 (<LOD-.070)	.100 (.070-.150)	671
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.080 (<LOD-.200)	290

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.05.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Di-p-cresylphosphate (DpCP) (creatinine corrected) (2013 – 2014)

CAS Number 843-24-3

Metabolite of Tri-p-cresylphosphate (TpCP)

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	.133 (.125-.152)	.200 (.182-.219)	2662
Age 6-11 years (2013 - 2014)	*	< LOD	.125 (<LOD-.174)	.247 (.182-.361)	.361 (.222-.500)	421
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.108 (.085-.174)	.200 (.108-.267)	427
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.133 (<LOD-.143)	.182 (.154-.200)	1814
Males (2013 - 2014)	*	< LOD	< LOD	.121 (.103-.138)	.174 (.135-.222)	1343
Females (2013 - 2014)	*	< LOD	< LOD	.154 (.133-.182)	.211 (.190-.235)	1319
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.143 (<LOD-.174)	.190 (.170-.235)	426
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.082 (<LOD-.101)	.114 (.093-.143)	587
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.138 (.125-.167)	.211 (.182-.235)	1014
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.138 (<LOD-.170)	.190 (.174-.222)	669
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.200 (<LOD-.333)	290

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Diphenyl phosphate (DPhP) (2013 – 2014)

CAS Number 838-85-7

Metabolite of Triphenyl phosphate (TPhP)

Geometric mean and selected percentiles of concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.845 (.772-.925)	.820 (.750-.920)	1.77 (1.58-1.91)	3.71 (3.14-4.63)	6.23 (5.16-7.90)	2660
Age 6-11 years (2013 - 2014)	1.69 (1.37-2.10)	1.70 (1.24-2.02)	3.47 (2.71-4.35)	8.17 (5.70-10.0)	13.0 (8.17-17.8)	420
Age 12-19 years (2013 - 2014)	1.41 (1.19-1.67)	1.44 (1.24-1.79)	2.99 (2.20-3.57)	5.31 (4.42-6.99)	7.96 (6.28-13.0)	426
Age 20+ years (2013 - 2014)	.727 (.668-.791)	.720 (.630-.790)	1.44 (1.36-1.57)	3.00 (2.66-3.43)	5.43 (3.98-6.23)	1814
Males (2013 - 2014)	.778 (.695-.871)	.800 (.690-.910)	1.56 (1.38-1.73)	3.00 (2.44-3.71)	4.91 (3.68-6.23)	1341
Females (2013 - 2014)	.915 (.826-1.01)	.890 (.760-1.00)	2.02 (1.81-2.25)	4.81 (3.56-5.81)	8.17 (5.69-11.3)	1319
Mexican Americans (2013 - 2014)	.898 (.798-1.01)	.850 (.730-1.07)	1.85 (1.50-2.38)	3.98 (2.90-5.32)	5.89 (4.64-8.32)	427
Non-Hispanic blacks (2013 - 2014)	1.09 (.944-1.27)	1.05 (.920-1.16)	2.16 (1.81-2.65)	5.06 (3.33-8.22)	8.69 (5.85-13.5)	586
Non-Hispanic whites (2013 - 2014)	.819 (.726-.923)	.800 (.680-.930)	1.71 (1.49-1.87)	3.54 (2.98-4.91)	6.23 (5.11-8.17)	1011
All Hispanics (2013 - 2014)	.880 (.775-1.00)	.830 (.740-1.02)	1.79 (1.48-2.29)	3.71 (2.97-4.51)	5.51 (4.43-6.40)	670
Asians (2013 - 2014)	.564 (.483-.659)	.570 (.410-.760)	1.28 (1.05-1.50)	2.65 (1.72-3.62)	4.11 (3.21-5.69)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.16.

Urinary Diphenyl phosphate (DPhP) (creatinine corrected) (2013 – 2014)

CAS Number 838-85-7

Metabolite of Triphenyl phosphate (TPhP)

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.904 (.846-.966)	.794 (.762-.850)	1.60 (1.40-1.81)	3.34 (2.84-4.10)	5.51 (4.72-6.36)	2658
Age 6-11 years (2013 - 2014)	2.18 (1.89-2.51)	1.95 (1.66-2.26)	3.70 (3.05-4.56)	7.17 (5.72-8.69)	9.66 (7.06-17.8)	420
Age 12-19 years (2013 - 2014)	1.21 (1.07-1.37)	1.12 (.940-1.32)	2.21 (1.62-2.79)	3.77 (3.00-5.46)	6.59 (4.02-8.47)	426
Age 20+ years (2013 - 2014)	.786 (.742-.834)	.695 (.643-.762)	1.30 (1.15-1.44)	2.70 (2.31-3.19)	4.82 (3.91-5.51)	1812
Males (2013 - 2014)	.715 (.671-.761)	.653 (.605-.715)	1.14 (1.08-1.28)	2.26 (1.96-2.67)	3.91 (2.69-4.90)	1340
Females (2013 - 2014)	1.13 (1.05-1.23)	1.00 (.910-1.11)	2.02 (1.80-2.36)	4.65 (3.60-5.46)	6.84 (5.77-8.47)	1318
Mexican Americans (2013 - 2014)	.928 (.820-1.05)	.800 (.654-1.02)	1.57 (1.33-1.92)	3.27 (2.70-4.08)	4.99 (3.77-6.44)	425
Non-Hispanic blacks (2013 - 2014)	.842 (.701-1.01)	.701 (.627-.789)	1.57 (1.19-2.06)	3.53 (2.37-5.46)	6.26 (4.01-9.66)	586
Non-Hispanic whites (2013 - 2014)	.930 (.855-1.01)	.824 (.757-.931)	1.64 (1.43-1.85)	3.55 (2.79-4.54)	5.52 (4.56-6.84)	1011
All Hispanics (2013 - 2014)	.913 (.807-1.03)	.800 (.669-.944)	1.56 (1.32-1.95)	3.24 (2.69-4.04)	5.18 (3.89-6.50)	668
Asians (2013 - 2014)	.718 (.646-.799)	.681 (.574-.788)	1.19 (1.00-1.44)	2.19 (1.72-3.62)	4.21 (2.62-5.04)	291

Urinary 2,3,4,5-Tetrabromobenzoic acid (TBBA) (2013 – 2014)

CAS Number 27581-13-1

Metabolite of 2-Ethylhexyl-2,3,4,5-tetrabromobenzoate (EH-TBB)

Geometric mean and selected percentiles of concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	.050 (<LOD-.060)	2665
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.070 (.050-.090)	421
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	427
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1817
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	.060 (<LOD-.070)	1344
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1321
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	428
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	.060 (<LOD-.090)	587
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	.050 (<LOD-.070)	1014
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	671
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	291

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.05.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2,3,4,5-Tetrabromobenzoic acid (TBBA) (creatinine corrected) (2013 – 2014)

CAS Number 27581-13-1

Metabolite of 2-Ethylhexyl-2,3,4,5-tetrabromobenzoate (EH-TBB)

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	.174 (<LOD-.190)	2663
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.235 (.167-.286)	421
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	427
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1815
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	.143 (<LOD-.182)	1343
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1320
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	426
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	.122 (<LOD-.154)	587
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	.182 (<LOD-.200)	1014
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	669
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	291

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary ortho-Phenylphenol (creatinine corrected) (2003 – 2010)‡

CAS Number 90-43-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	.100 (<LOD-.200)	.300 (.200-.400)	.500 (.400-.700)	.800 (.600-1.10)	2525
Total population (2005 - 2006)	*	< LOD	< LOD	.300 (.200-.400)	.500 (.400-.800)	2548
Total population (2007 - 2008)	*	< LOD	< LOD	.100 (.100-.200)	.300 (.200-.400)	2604
Total population (2009 - 2010)	*	< LOD	< LOD	.300 (.300-.400)	.500 (.500-.600)	2749
Age 6-11 years (2003 - 2004)	.180 (.158-.206)	.200 (.200-.200)	.300 (.300-.400)	.600 (.500-.800)	.800 (.500-1.30)	314
Age 6-11 years (2005 - 2006)	*	< LOD	.100 (<LOD-.200)	.500 (.300-1.10)	1.30 (.700-1.90)	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.300 (.200-.500)	.600 (.300-1.00)	389
Age 6-11 years (2009 - 2010)	*	< LOD	.200 (<LOD-.300)	.400 (.300-.700)	.600 (.400-1.20)	415
Age 12-19 years (2003 - 2004)	.175 (.149-.206)	.200 (.100-.200)	.400 (.300-.500)	.600 (.500-.800)	.900 (.700-1.30)	722
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.300 (.200-.500)	.600 (.500-.800)	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.100 (.100-.200)	.300 (.200-.600)	401
Age 12-19 years (2009 - 2010)	*	< LOD	.200 (<LOD-.300)	.400 (.300-.500)	.600 (.500-.900)	420
Age 20+ years (2003 - 2004)	*	.100 (<LOD-.100)	.300 (.200-.400)	.500 (.400-.700)	.800 (.600-1.10)	1489
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	.300 (.100-.400)	.500 (.400-.800)	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	.100 (<LOD-.200)	.300 (.200-.400)	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	.300 (.300-.400)	.500 (.400-.500)	1914
Males (2003 - 2004)	*	.100 (<LOD-.200)	.400 (.300-.400)	.600 (.500-.700)	.800 (.600-1.00)	1231
Males (2005 - 2006)	*	< LOD	< LOD	.300 (.200-.400)	.500 (.400-.900)	1270
Males (2007 - 2008)	*	< LOD	< LOD	.100 (<LOD-.200)	.300 (.200-.500)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.300 (.300-.400)	.500 (.500-.700)	1399
Females (2003 - 2004)	*	.100 (<LOD-.200)	.300 (.200-.400)	.500 (.400-.700)	.800 (.600-1.20)	1294
Females (2005 - 2006)	*	< LOD	< LOD	.300 (.200-.400)	.500 (.400-.800)	1278
Females (2007 - 2008)	*	< LOD	< LOD	.100 (<LOD-.200)	.300 (.200-.500)	1310
Females (2009 - 2010)	*	< LOD	< LOD	.300 (.300-.400)	.500 (.400-.500)	1350
Mexican Americans (2003 - 2004)	.191 (.150-.245)	.200 (.100-.300)	.400 (.300-.600)	.700 (.500-1.10)	1.10 (.600-1.60)	617
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.400 (.100-.900)	.800 (.400-3.20)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.100 (<LOD-.300)	.400 (.200-1.10)	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.300 (.200-.400)	.400 (.300-.900)	566
Non-Hispanic blacks (2003 - 2004)	*	.100 (<LOD-.200)	.400 (.300-.400)	.600 (.500-.800)	1.00 (.600-1.40)	636
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	.400 (.300-.500)	.500 (.400-.700)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.200 (<LOD-.300)	.400 (.200-.600)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.200 (<LOD-.300)	.400 (.300-.600)	.700 (.500-.800)	516
Non-Hispanic whites (2003 - 2004)	*	.100 (<LOD-.100)	.300 (.200-.400)	.500 (.400-.700)	.800 (.600-1.00)	1077
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	.300 (.100-.400)	.500 (.300-1.10)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.100 (<LOD-.200)	.300 (.200-.500)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.300 (.300-.400)	.500 (.400-.600)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.1, 0.1, 0.1, and 0.2 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Orthophenylphenol_BiomonitoringSummary.html

Urinary ortho-Phenylphenol (creatinine corrected) (2003 – 2010)‡

CAS Number 90-43-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	.150 (<LOD-.170)	.320 (.270-.380)	.670 (.500-.800)	.950 (.750-1.31)	2522
Total population (2005 - 2006)	*	< LOD	< LOD	.370 (.310-.410)	.600 (.470-.750)	2548
Total population (2007 - 2008)	*	< LOD	< LOD	.290 (.250-.330)	.470 (.400-.520)	2604
Total population (2009 - 2010)	*	< LOD	< LOD	.560 (.480-.640)	.820 (.700-.910)	2749
Age 6-11 years (2003 - 2004)	.219 (.189-.255)	.230 (.170-.280)	.400 (.330-.540)	.760 (.530-.860)	.880 (.760-1.90)	314
Age 6-11 years (2005 - 2006)	*	< LOD	.180 (<LOD-.240)	.590 (.430-.930)	1.94 (.710-2.94)	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.390 (.240-.660)	.660 (.390-1.31)	389
Age 6-11 years (2009 - 2010)	*	< LOD	.410 (<LOD-.480)	.820 (.560-1.06)	1.22 (.850-1.56)	415
Age 12-19 years (2003 - 2004)	.131 (.110-.156)	.140 (.100-.160)	.270 (.230-.340)	.490 (.400-.690)	.790 (.550-1.30)	720
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.280 (.220-.320)	.410 (.330-.710)	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.190 (.170-.250)	.330 (.240-.470)	401
Age 12-19 years (2009 - 2010)	*	< LOD	.250 (<LOD-.300)	.420 (.300-.550)	.550 (.390-1.20)	420
Age 20+ years (2003 - 2004)	*	.140 (<LOD-.170)	.320 (.260-.370)	.670 (.500-.800)	1.00 (.740-1.38)	1488
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	.370 (.300-.410)	.540 (.430-.710)	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	.300 (<LOD-.330)	.470 (.390-.520)	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	.560 (.480-.640)	.820 (.700-.880)	1914
Males (2003 - 2004)	*	.130 (<LOD-.150)	.290 (.240-.340)	.570 (.430-.740)	.880 (.720-1.06)	1230
Males (2005 - 2006)	*	< LOD	< LOD	.280 (.200-.350)	.470 (.350-.670)	1270
Males (2007 - 2008)	*	< LOD	< LOD	.220 (<LOD-.250)	.350 (.300-.440)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.440 (.360-.540)	.670 (.510-.850)	1399
Females (2003 - 2004)	*	.170 (<LOD-.200)	.350 (.280-.440)	.700 (.500-.940)	1.07 (.730-1.57)	1292
Females (2005 - 2006)	*	< LOD	< LOD	.430 (.370-.500)	.700 (.500-1.03)	1278
Females (2007 - 2008)	*	< LOD	< LOD	.350 (<LOD-.440)	.500 (.440-.580)	1310
Females (2009 - 2010)	*	< LOD	< LOD	.640 (.570-.700)	.930 (.780-1.17)	1350
Mexican Americans (2003 - 2004)	.174 (.132-.229)	.170 (.120-.240)	.440 (.280-.590)	.770 (.560-1.09)	1.11 (.770-1.72)	616
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.370 (.210-.670)	.740 (.390-1.71)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.250 (<LOD-.290)	.430 (.320-.910)	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.420 (.370-.560)	.680 (.560-.880)	566
Non-Hispanic blacks (2003 - 2004)	*	.110 (<LOD-.130)	.250 (.200-.310)	.530 (.380-.650)	.770 (.600-1.02)	635
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	.290 (.220-.370)	.440 (.380-.540)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.210 (<LOD-.250)	.330 (.250-.640)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.220 (<LOD-.240)	.370 (.310-.450)	.570 (.440-.860)	516
Non-Hispanic whites (2003 - 2004)	*	.150 (<LOD-.180)	.330 (.260-.390)	.690 (.470-.830)	1.00 (.740-1.38)	1076
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	.390 (.320-.430)	.610 (.470-.880)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.300 (<LOD-.370)	.470 (.390-.580)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.610 (.520-.700)	.870 (.700-.940)	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Orthophenylphenol_BiomonitoringSummary.html

Urinary Ethylene thiourea (2003 – 2008)

CAS Number 96-45-7

Metabolite of Several Dithiocarbamate Fungicides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.310 (<LOD-.560)	2169
Total population (2005 - 2006)	*	< LOD	< LOD	.600 (<LOD-1.08)	1.34 (.900-1.75)	2585
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	.430 (<LOD-.960)	2571
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	280
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	.830 (<LOD-1.53)	1.55 (.960-3.11)	342
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.610 (<LOD-1.17)	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.600 (<LOD-.920)	622
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.580 (<LOD-1.11)	1.34 (.660-2.23)	698
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.440 (<LOD-.970)	387
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.310 (<LOD-.580)	827
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	.750 (.500-1.18)	1.42 (1.05-1.75)	1072
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.510 (<LOD-1.19)	1169
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	440
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	.360 (<LOD-.780)	473
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	633
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	.360 (<LOD-.530)	1056
Males (2005 - 2006)	*	< LOD	< LOD	.940 (.530-1.19)	1.51 (1.08-2.09)	1219
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	.430 (<LOD-1.05)	1289
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1113
Females (2005 - 2006)	*	< LOD	< LOD	.370 (<LOD-.890)	.950 (.500-1.58)	1366
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	.410 (<LOD-.960)	1282
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	495
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.440 (<LOD-.960)	1.12 (.650-1.76)	686
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	.340 (<LOD-.630)	491
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	.480 (<LOD-1.06)	607
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	1.37 (.790-2.05)	2.22 (1.37-3.77)	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	.630 (<LOD-2.42)	570
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.330 (<LOD-.560)	925
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	.570 (<LOD-1.02)	1.18 (.940-1.42)	998
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	.300 (<LOD-.750)	1084

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.1, 0.24, and 0.21 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/ETUPTU_BiomonitoringSummary.html

Urinary Ethylene thiourea (creatinine corrected) (2003 – 2008)

CAS Number 96-45-7

Metabolite of Several Dithiocarbamate Fungicides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.434 (<LOD-.538)	2167
Total population (2005 - 2006)	*	< LOD	< LOD	.792 (<LOD-1.06)	1.32 (1.06-1.58)	2585
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	.789 (<LOD-1.00)	2569
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	280
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	1.04 (<LOD-1.36)	2.36 (1.16-3.12)	342
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.974 (<LOD-1.50)	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.423 (<LOD-.700)	621
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.582 (<LOD-.893)	.967 (.680-1.58)	698
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.417 (<LOD-.652)	385
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.425 (<LOD-.506)	826
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	.892 (.708-1.21)	1.36 (1.21-1.78)	1072
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.789 (<LOD-1.31)	1169
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	440
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.00 (<LOD-1.21)	473
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	633
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	.350 (<LOD-.467)	1055
Males (2005 - 2006)	*	< LOD	< LOD	.783 (.634-1.04)	1.28 (1.05-1.45)	1219
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	.529 (<LOD-.652)	1288
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1112
Females (2005 - 2006)	*	< LOD	< LOD	.827 (<LOD-1.21)	1.33 (1.00-2.01)	1366
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	.938 (<LOD-1.25)	1281
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	494
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.748 (<LOD-1.17)	1.33 (.837-1.89)	686
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	.714 (<LOD-1.10)	490
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	.368 (<LOD-.619)	607
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	1.02 (.649-1.74)	1.84 (1.04-2.50)	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	.652 (<LOD-1.34)	569
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.434 (<LOD-.583)	924
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	.773 (<LOD-1.04)	1.25 (.968-1.48)	998
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	.750 (<LOD-.882)	1084

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/ETUPTU_BiomonitoringSummary.html

Urinary Pentachlorophenol (2003 – 2004)

CAS Number 87-86-5

Also a Metabolite of Several Organochlorine Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	1.12 (.570-1.58)	2.57 (2.08-2.99)	3.63 (2.98-4.61)	2354
Age 6-11 years (2003 - 2004)	*	< LOD	1.57 (.970-2.25)	3.23 (2.12-5.67)	5.67 (2.94-6.38)	290
Age 12-19 years (2003 - 2004)	*	< LOD	1.36 (.760-1.99)	2.88 (2.08-3.53)	3.80 (3.06-6.38)	674
Age 20-59 years (2003 - 2004)	*	< LOD	.980 (<LOD-1.50)	2.40 (1.73-2.79)	3.11 (2.75-3.65)	889
Age 60+ years (2003 - 2004)	*	< LOD	1.14 (.540-1.74)	2.76 (2.17-3.60)	4.77 (3.29-5.88)	501
Males (2003 - 2004)	*	< LOD	1.32 (.720-2.05)	2.79 (2.46-3.40)	4.58 (3.50-5.49)	1147
Females (2003 - 2004)	*	< LOD	.880 (<LOD-1.41)	2.12 (1.71-2.74)	3.20 (2.44-3.84)	1207
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	1.73 (.640-3.38)	2.44 (1.73-3.84)	550
Non-Hispanic blacks (2003 - 2004)	*	< LOD	1.46 (1.11-1.93)	2.79 (2.22-3.65)	4.06 (3.20-4.77)	610
Non-Hispanic whites (2003 - 2004)	*	< LOD	1.17 (.580-1.74)	2.66 (2.06-3.23)	3.69 (2.99-5.17)	1039

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Pentachlorophenol_BiomonitoringSummary.html

Urinary Pentachlorophenol (creatinine corrected) (2003 – 2004)

CAS Number 87-86-5

Also a Metabolite of Several Organochlorine Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	1.22 (1.01-1.52)	2.30 (1.84-2.77)	3.44 (2.69-3.96)	2352
Age 6-11 years (2003 - 2004)	*	< LOD	1.75 (1.38-2.69)	3.72 (2.50-4.96)	4.96 (3.59-10.6)	290
Age 12-19 years (2003 - 2004)	*	< LOD	1.11 (.800-1.28)	1.67 (1.31-2.65)	2.76 (1.64-3.89)	673
Age 20-59 years (2003 - 2004)	*	< LOD	1.10 (<LOD-1.31)	1.99 (1.66-2.59)	2.92 (2.20-3.81)	888
Age 60+ years (2003 - 2004)	*	< LOD	1.65 (1.30-1.99)	2.64 (2.14-3.50)	4.15 (2.92-4.90)	501
Males (2003 - 2004)	*	< LOD	1.10 (.825-1.38)	1.93 (1.62-2.65)	3.23 (2.06-4.94)	1146
Females (2003 - 2004)	*	< LOD	1.37 (<LOD-1.74)	2.50 (2.13-2.98)	3.50 (2.79-4.07)	1206
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	1.54 (1.01-2.69)	2.33 (1.40-4.62)	549
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.919 (.679-1.25)	1.88 (1.42-2.77)	2.94 (2.21-3.76)	610
Non-Hispanic whites (2003 - 2004)	*	< LOD	1.35 (1.08-1.64)	2.42 (1.94-3.18)	3.54 (2.77-4.78)	1038

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Pentachlorophenol_BiomonitoringSummary.html

Urinary Propylene thiourea (2003 – 2008)

CAS Number 2122-19-2

Metabolite of Propineb

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2456
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2628
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2573
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	305
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	349
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	702
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	387
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	926
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1086
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1170
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	523
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	475
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	634
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1209
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1246
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1247
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1382
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1284
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	598
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	693
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	493
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	637
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	570
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1062
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1006
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.1, 0.37, and 0.36 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/ETUPTU_BiomonitoringSummary.html

Urinary Propylene thiourea (creatinine corrected) (2003 – 2008)

CAS Number 2122-19-2

Metabolite of Propineb

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2454
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2628
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2571
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	305
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	349
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	701
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	385
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	925
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1086
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1170
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	523
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	475
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	634
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1208
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1246
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1288
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1246
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1382
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1283
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	597
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	693
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	492
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	637
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	569
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1061
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1006
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/ETUPTU_BiomonitoringSummary.html

Urinary Atrazine (2007 – 2008)‡

CAS Number 1912-24-9

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2588
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1179
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	635
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	501
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	573
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1085

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Atrazine (creatinine corrected) (2007 – 2008)‡

CAS Number 1912-24-9

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2586
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	388
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1179
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	635
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1293
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1293
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	500
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	572
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1085

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Atrazine mercapturate (2007 – 2008)‡

CAS Number 138722-96-0

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2588
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1179
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	635
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	501
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	573
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1085

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Atrazine mercapturate (creatinine corrected) (2007 – 2008)‡

CAS Number 138722-96-0

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2586
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	388
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1179
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	635
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1293
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1293
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	500
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	572
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1085

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Desethyl atrazine (2007 – 2008)‡

CAS Number 6190-65-4

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2482
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	360
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	382
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1129
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	611
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1234
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1248
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	462
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	563
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1048

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 is 0.25.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Desethyl atrazine (creatinine corrected) (2007 – 2008)‡

CAS Number 6190-65-4

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2480
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	360
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	380
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1129
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	611
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1233
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1247
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	461
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	562
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1048

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Desisopropyl atrazine (2007 – 2008)‡

CAS Number 1007-28-9

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2445
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	367
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	361
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1113
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	604
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1224
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1221
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	493
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	537
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1010

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 is 0.25.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Desisopropyl atrazine (creatinine corrected) (2007 – 2008)‡

CAS Number 1007-28-9

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2444
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	367
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	360
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1113
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	604
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1223
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1221
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	492
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	537
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1010

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Desisopropyl atrazine mercapturate (2007 – 2008)‡

CAS Number 1007-28-9

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2480
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	372
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1135
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	607
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1233
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1247
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	486
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	531
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1039

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Desisopropyl atrazine mercapturate (creatinine corrected) (2007 – 2008)‡

CAS Number 1007-28-9

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2478
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	370
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1135
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	607
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1232
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1246
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	485
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	530
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1039

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Diaminochloroatrazine (2007 – 2008)‡

CAS Number 1007-28-9

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2588
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1179
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	635
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	501
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	573
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1085

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary Diaminochloroatrazine (creatinine corrected) (2007 – 2008)‡

CAS Number 1007-28-9

Metabolite of Atrazine

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2586
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	388
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1179
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	635
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1293
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1293
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	500
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	572
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1085

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Only measured in Survey years 2007-2008.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Atrazine_BiomonitoringSummary.html

Urinary 2,4-Dichlorophenoxyacetic acid (1999 – 2010)‡

CAS Number 94-75-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1977
Total population (2001 - 2002)	*	< LOD	.220 (<LOD-.310)	.690 (.560-.880)	1.26 (1.01-1.36)	2903
Total population (2003 - 2004)	.245 (.210-.286)	.230 (.180-.320)	.580 (.490-.660)	1.10 (.910-1.34)	1.71 (1.41-2.37)	2488
Total population (2007 - 2008)	*	< LOD	.550 (.530-.590)	1.06 (.940-1.19)	1.60 (1.38-1.79)	2587
Total population (2009 - 2010)	.308 (.275-.345)	.280 (.250-.320)	.530 (.470-.600)	.930 (.810-1.08)	1.43 (1.12-2.02)	2747
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	1.30 (<LOD-2.40)	477
Age 6-11 years (2001 - 2002)	*	< LOD	.310 (.210-.400)	.740 (.550-1.13)	1.55 (1.00-2.21)	546
Age 6-11 years (2003 - 2004)	.266 (.214-.332)	.290 (.200-.390)	.670 (.440-.920)	1.03 (.890-1.40)	1.88 (1.01-2.54)	309
Age 6-11 years (2007 - 2008)	*	< LOD	.720 (.630-.860)	1.44 (1.15-1.64)	1.93 (1.62-2.84)	385
Age 6-11 years (2009 - 2010)	.385 (.330-.449)	.350 (.290-.440)	.670 (.510-.780)	1.20 (.860-1.58)	1.59 (1.36-2.77)	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	1.10 (<LOD-1.60)	677
Age 12-19 years (2001 - 2002)	*	< LOD	.250 (<LOD-.420)	.690 (.440-1.16)	1.24 (.690-1.66)	797
Age 12-19 years (2003 - 2004)	.256 (.212-.310)	.260 (.180-.380)	.580 (.470-.710)	1.04 (.890-1.31)	1.66 (1.20-2.97)	714
Age 12-19 years (2007 - 2008)	*	< LOD	.590 (.530-.670)	1.29 (.790-1.97)	2.38 (1.46-2.73)	390
Age 12-19 years (2009 - 2010)	.301 (.248-.366)	.280 (.240-.330)	.490 (.420-.620)	.900 (.660-1.05)	1.12 (.880-2.88)	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	823
Age 20-59 years (2001 - 2002)	*	< LOD	.210 (<LOD-.310)	.690 (.540-.910)	1.27 (.930-1.49)	1070
Age 20-59 years (2003 - 2004)	.239 (.205-.279)	.220 (.170-.300)	.570 (.480-.640)	.980 (.840-1.35)	1.55 (1.25-2.50)	937
Age 20-59 years (2007 - 2008)	*	< LOD	.530 (.490-.570)	.970 (.800-1.17)	1.36 (1.22-1.78)	1179
Age 20-59 years (2009 - 2010)	.288 (.259-.319)	.270 (.230-.310)	.500 (.440-.560)	.870 (.740-1.04)	1.33 (1.05-1.69)	1309
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	.560 (.390-.870)	1.26 (.690-1.78)	490
Age 60+ years (2003 - 2004)	.248 (.205-.301)	.210 (.130-.320)	.560 (.470-.680)	1.36 (1.07-1.90)	2.42 (1.66-3.67)	528
Age 60+ years (2007 - 2008)	*	< LOD	.560 (.530-.640)	1.02 (.840-1.12)	1.46 (1.10-2.11)	633
Age 60+ years (2009 - 2010)	.349 (.294-.414)	.300 (.230-.390)	.590 (.510-.720)	1.11 (.810-1.57)	2.08 (1.16-5.40)	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	1.10 (<LOD-1.80)	962
Males (2001 - 2002)	*	< LOD	.330 (.220-.490)	.890 (.690-1.17)	1.49 (1.26-2.03)	1364
Males (2003 - 2004)	.276 (.240-.317)	.290 (.210-.370)	.630 (.540-.740)	1.22 (.960-1.42)	2.12 (1.42-2.73)	1218
Males (2007 - 2008)	*	< LOD	.610 (.580-.650)	1.26 (1.05-1.38)	2.11 (1.68-2.41)	1292
Males (2009 - 2010)	.347 (.298-.404)	.320 (.270-.370)	.580 (.500-.690)	1.05 (.810-1.47)	1.82 (1.12-4.14)	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1015
Females (2001 - 2002)	*	< LOD	< LOD	.470 (.360-.620)	.890 (.670-1.21)	1539
Females (2003 - 2004)	.219 (.181-.264)	.190 (.110-.280)	.490 (.400-.630)	.980 (.860-1.33)	1.48 (1.31-2.27)	1270
Females (2007 - 2008)	*	< LOD	.500 (.460-.540)	.870 (.790-1.01)	1.28 (1.12-1.42)	1295
Females (2009 - 2010)	.275 (.250-.303)	.260 (.220-.300)	.480 (.440-.540)	.860 (.740-.950)	1.14 (.970-1.39)	1404

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 07-08 and 09-10 are 0.952, 0.2, and 0.1, 0.4 and 0.15 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result. ‡ Not measured in Survey years 2005-2006

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/24-DichlorophenoxyaceticAcid_BiomonitoringSummary.html

Urinary 2,4-Dichlorophenoxyacetic acid (1999 – 2010)‡

CAS Number 94-75-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	695
Mexican Americans (2001 - 2002)	*	< LOD	.250 (<LOD-.330)	.730 (.610-.890)	1.20 (.960-1.36)	743
Mexican Americans (2003 - 2004)	.313 (.256-.383)	.340 (.260-.440)	.730 (.610-.840)	1.42 (1.02-1.52)	1.81 (1.23-3.53)	606
Mexican Americans (2007 - 2008)	*	< LOD	.520 (.470-.590)	.860 (.790-1.00)	1.46 (.950-2.22)	500
Mexican Americans (2009 - 2010)	.276 (.240-.318)	.250 (.210-.300)	.470 (.410-.570)	.840 (.680-1.08)	1.23 (.830-2.02)	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.70)	520
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	.560 (.420-.890)	1.06 (.790-1.48)	743
Non-Hispanic blacks (2003 - 2004)	*	.190 (<LOD-.290)	.510 (.380-.630)	.910 (.750-1.22)	1.31 (.990-1.98)	648
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.580 (.530-.630)	1.05 (.910-1.20)	1.49 (1.23-1.97)	574
Non-Hispanic blacks (2009 - 2010)	.284 (.251-.321)	.260 (.240-.290)	.460 (.390-.540)	.790 (.620-1.03)	1.11 (.790-1.81)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	589
Non-Hispanic whites (2001 - 2002)	*	< LOD	.240 (<LOD-.360)	.730 (.560-.980)	1.30 (1.01-1.66)	1201
Non-Hispanic whites (2003 - 2004)	.254 (.211-.306)	.240 (.180-.360)	.590 (.470-.720)	1.17 (.930-1.41)	2.00 (1.40-2.51)	1076
Non-Hispanic whites (2007 - 2008)	*	< LOD	.560 (.540-.600)	1.12 (.940-1.29)	1.61 (1.36-2.16)	1083
Non-Hispanic whites (2009 - 2010)	.328 (.281-.382)	.300 (.250-.370)	.570 (.480-.680)	.980 (.830-1.20)	1.57 (1.14-2.77)	1200

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 07-08 and 07-08 are 0.952, 0.2, and 0.1, 0.4 and 0.15 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result. ‡ Not measured in Survey years 2005-2006

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/24-DichlorophenoxyaceticAcid_BiomonitoringSummary.html

Urinary 2,4-Dichlorophenoxyacetic acid (creatinine corrected) (1999 – 2010)‡

CAS Number 94-75-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1977
Total population (2001 - 2002)	*	< LOD	.378 (<LOD-.412)	.700 (.635-.778)	1.12 (1.03-1.26)	2901
Total population (2003 - 2004)	.241 (.203-.287)	.253 (.206-.290)	.500 (.423-.610)	1.03 (.855-1.28)	1.85 (1.42-2.50)	2486
Total population (2007 - 2008)	*	< LOD	.737 (.667-.779)	1.28 (1.17-1.40)	1.84 (1.65-2.12)	2585
Total population (2009 - 2010)	.321 (.286-.360)	.301 (.272-.329)	.500 (.458-.573)	.983 (.846-1.19)	1.55 (1.30-2.12)	2747
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	1.32 (<LOD-2.24)	477
Age 6-11 years (2001 - 2002)	*	< LOD	.485 (.378-.679)	1.13 (.825-1.35)	1.41 (1.27-1.73)	546
Age 6-11 years (2003 - 2004)	.323 (.249-.421)	.320 (.250-.440)	.744 (.500-1.06)	1.30 (.990-2.55)	2.55 (1.23-5.16)	309
Age 6-11 years (2007 - 2008)	*	< LOD	.970 (.817-1.24)	1.65 (1.47-1.85)	2.96 (1.65-6.18)	385
Age 6-11 years (2009 - 2010)	.521 (.444-.610)	.478 (.411-.531)	.792 (.674-1.06)	1.52 (1.21-1.74)	2.20 (1.53-3.02)	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	.593 (<LOD-1.05)	677
Age 12-19 years (2001 - 2002)	*	< LOD	.275 (<LOD-.376)	.483 (.328-.662)	.662 (.517-.918)	796
Age 12-19 years (2003 - 2004)	.193 (.160-.232)	.205 (.157-.250)	.419 (.328-.460)	.709 (.540-.925)	1.23 (.837-2.35)	713
Age 12-19 years (2007 - 2008)	*	< LOD	.555 (.475-.651)	.908 (.778-1.05)	1.56 (.950-2.79)	388
Age 12-19 years (2009 - 2010)	.258 (.212-.314)	.256 (.200-.299)	.358 (.320-.439)	.706 (.439-1.05)	1.05 (.579-3.27)	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	823
Age 20-59 years (2001 - 2002)	*	< LOD	.378 (<LOD-.412)	.667 (.593-.778)	1.08 (.806-1.29)	1070
Age 20-59 years (2003 - 2004)	.227 (.188-.274)	.242 (.196-.278)	.452 (.397-.545)	.923 (.708-1.20)	1.48 (1.14-2.43)	936
Age 20-59 years (2007 - 2008)	*	< LOD	.667 (.588-.769)	1.17 (1.04-1.34)	1.65 (1.43-2.33)	1179
Age 20-59 years (2009 - 2010)	.288 (.259-.321)	.276 (.250-.309)	.458 (.418-.507)	.860 (.750-.962)	1.36 (1.00-1.88)	1309
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	.824 (.583-1.10)	1.34 (1.00-2.16)	489
Age 60+ years (2003 - 2004)	.301 (.248-.366)	.310 (.237-.385)	.657 (.510-.866)	1.54 (1.16-1.95)	3.00 (1.95-6.36)	528
Age 60+ years (2007 - 2008)	*	< LOD	.860 (.781-.903)	1.53 (1.27-1.72)	1.96 (1.60-2.33)	633
Age 60+ years (2009 - 2010)	.414 (.356-.480)	.354 (.306-.407)	.667 (.548-.812)	1.41 (.983-1.99)	2.87 (1.49-4.49)	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	.667 (<LOD-1.16)	962
Males (2001 - 2002)	*	< LOD	.336 (.272-.412)	.652 (.560-.825)	1.14 (.979-1.39)	1364
Males (2003 - 2004)	.227 (.189-.271)	.238 (.194-.276)	.473 (.412-.564)	.941 (.767-1.23)	1.80 (1.09-2.79)	1217
Males (2007 - 2008)	*	< LOD	.596 (.538-.670)	1.14 (.980-1.24)	1.63 (1.47-2.15)	1291
Males (2009 - 2010)	.309 (.266-.359)	.282 (.242-.323)	.481 (.413-.554)	1.01 (.707-1.57)	1.80 (1.06-3.88)	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1015
Females (2001 - 2002)	*	< LOD	< LOD	.711 (.631-.809)	1.10 (.933-1.26)	1537
Females (2003 - 2004)	.256 (.213-.308)	.263 (.212-.311)	.522 (.435-.645)	1.14 (.900-1.42)	1.85 (1.42-2.64)	1269
Females (2007 - 2008)	*	< LOD	.854 (.757-.903)	1.47 (1.23-1.58)	1.91 (1.65-2.33)	1294
Females (2009 - 2010)	.334 (.302-.369)	.319 (.288-.355)	.533 (.475-.611)	.953 (.862-1.10)	1.40 (1.21-1.55)	1404

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

*Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured in Survey years 2005-2006

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/24-DichlorophenoxyaceticAcid_BiomonitoringSummary.html

Urinary 2,4-Dichlorophenoxyacetic acid (creatinine corrected) (1999 – 2010)‡

CAS Number 94-75-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	695
Mexican Americans (2001 - 2002)	*	< LOD	.350 (<LOD-.386)	.720 (.583-.840)	1.08 (.778-1.56)	743
Mexican Americans (2003 - 2004)	.287 (.223-.371)	.309 (.194-.459)	.593 (.463-.771)	1.08 (.833-1.36)	1.54 (1.17-3.19)	605
Mexican Americans (2007 - 2008)	*	< LOD	.622 (.571-.691)	1.15 (.903-1.43)	1.74 (1.37-2.33)	499
Mexican Americans (2009 - 2010)	.289 (.255-.326)	.282 (.255-.300)	.434 (.392-.495)	.781 (.565-1.11)	1.30 (.733-2.63)	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	.593 (<LOD-1.19)	520
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	.467 (.349-.583)	.778 (.552-.975)	742
Non-Hispanic blacks (2003 - 2004)	*	.140 (<LOD-.194)	.304 (.264-.356)	.629 (.461-.815)	.970 (.719-1.50)	648
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.509 (.457-.596)	.966 (.875-1.07)	1.33 (1.12-1.75)	573
Non-Hispanic blacks (2009 - 2010)	.215 (.192-.240)	.195 (.180-.218)	.344 (.314-.400)	.628 (.489-.822)	1.06 (.714-1.38)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	589
Non-Hispanic whites (2001 - 2002)	*	< LOD	.412 (<LOD-.455)	.769 (.667-.894)	1.25 (1.05-1.40)	1200
Non-Hispanic whites (2003 - 2004)	.263 (.213-.326)	.269 (.226-.318)	.539 (.434-.665)	1.13 (.941-1.46)	2.34 (1.54-2.73)	1075
Non-Hispanic whites (2007 - 2008)	*	< LOD	.780 (.737-.871)	1.36 (1.17-1.55)	2.00 (1.60-2.49)	1083
Non-Hispanic whites (2009 - 2010)	.357 (.308-.414)	.328 (.288-.384)	.547 (.485-.644)	1.10 (.897-1.40)	1.79 (1.35-3.02)	1200

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result. ‡ Not measured in Survey years 2005-2006

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/24-DichlorophenoxyaceticAcid_BiomonitoringSummary.html

Urinary 2,4,5-Trichlorophenoxyacetic acid (1999 – 2010)‡

CAS Number 93-76-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1814
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3047
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.140 (<LOD-.210)	2416
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2588
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2747
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	430
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	580
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.110 (<LOD-.160)	303
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	385
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	618
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	831
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.140 (<LOD-.190)	701
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	766
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1127
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.160 (<LOD-.250)	908
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1180
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1309
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	509
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	.140 (<LOD-.230)	504
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	633
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	891
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1428
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	.140 (<LOD-.210)	1184
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1293
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	923
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1619
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	.150 (<LOD-.230)	1232
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1295
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1404

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 07-08 and 09-10 are 1.2, 0.1, and 0.1, 0.1 and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured in Survey years 2005-2006 or after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/245-TrichlorophenoxyaceticAcid_BiomonitoringSummary.html

Urinary 2,4,5-Trichlorophenoxyacetic acid (1999 – 2010)‡

CAS Number 93-76-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	652
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	766
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.120 (<LOD-.340)	.200 (<LOD-.390)	605
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	500
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	483
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	776
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	641
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	574
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	531
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1281
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.150 (<LOD-.230)	1013
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1200

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 07-08 and 07-08 are 1.2, 0.1, and 0.1, 0.1 and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured in Survey years 2005-2006 or after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/245-TrichlorophenoxyaceticAcid_BiomonitoringSummary.html

Urinary 2,4,5-Trichlorophenoxyacetic acid (creatinine corrected) (1999 – 2010)†

CAS Number 93-76-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1814
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3045
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.333 (<LOD-.412)	2414
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2586
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2747
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	430
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	580
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.318 (<LOD-.368)	303
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	385
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	618
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	830
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.226 (<LOD-.269)	700
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	388
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	766
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1127
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.350 (<LOD-.438)	907
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1180
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1309
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	508
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	.368 (<LOD-.538)	504
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	633
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	891
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1428
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	.253 (<LOD-.350)	1183
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1292
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	923
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1617
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	.432 (<LOD-.500)	1231
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1404

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.†Not measured in Survey years 2005-2006 or after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/245-TrichlorophenoxyaceticAcid_BiomonitoringSummary.html

Urinary 2,4,5-Trichlorophenoxyacetic acid (creatinine corrected) (1999 – 2010)‡

CAS Number 93-76-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	652
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	766
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.200 (<LOD-.333)	.333 (<LOD-.467)	604
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	499
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	483
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	775
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	641
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	573
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	531
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1280
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.350 (<LOD-.438)	1012
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1200

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured in Survey years 2005-2006 or after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/245-TrichlorophenoxyaceticAcid_BiomonitoringSummary.html

Urinary Bensulfuron-methyl (2003 – 2008)

CAS Number 83055-99-6

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2355
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2494
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	286
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	374
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	671
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	381
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1398
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1739
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1150
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1240
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1205
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1254
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	567
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	477
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	617
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	558
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1018
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1053

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.05, 0.05, and 0.05 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Bensulfuron-methyl (creatinine corrected) (2003 – 2008)

CAS Number 83055-99-6

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2353
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2492
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	286
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	374
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	670
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	379
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1397
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1739
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1149
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1239
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1204
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1253
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	566
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	476
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	617
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	557
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1017
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1053

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Chlorsulfuron (2003 – 2008)

CAS Number 64902-72-3

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2100
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2419
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2566
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	259
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	314
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	380
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	601
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	653
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	386
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1240
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1452
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1800
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1031
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1151
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1285
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1069
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1268
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1281
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	506
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	633
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	491
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	658
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	570
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	894
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	940
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1081

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.06, 0.06, and 0.06 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Chlorsulfuron (creatinine corrected) (2003 – 2008)

CAS Number 64902-72-3

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2098
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2419
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2564
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	259
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	314
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	380
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	600
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	653
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1239
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1452
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1800
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1030
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1151
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1284
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1068
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1268
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1280
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	505
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	633
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	490
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	658
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	569
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	893
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	940
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1081

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Ethametsulfuron-methyl (2003 – 2008)

CAS Number 97780-06-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2321
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2458
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	294
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	671
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	381
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1356
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1711
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1132
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1218
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1189
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1240
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	590
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	468
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	608
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	534
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	974
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1052

Limit of detection (LOD, see Data Analysis section) for Survey year 03-04, 05-06, and 07-08 are 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Ethametsulfuron-methyl (creatinine corrected) (2003 – 2008)

CAS Number 97780-06-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2319
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2456
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	294
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	670
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	379
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1355
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1711
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1131
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1217
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1188
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1239
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	589
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	467
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	608
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	533
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	973
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1052

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Foramsulfuron (2003 – 2008)

CAS Number 173159-57-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2255
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2534
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2423
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	283
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	334
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	364
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	653
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	688
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	364
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1319
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1512
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1695
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1097
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1203
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1205
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1158
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1331
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1218
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	587
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	632
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	487
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	584
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	711
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	523
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	935
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	990
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1004

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.05, 0.05, and 0.05 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Foramsulfuron (creatinine corrected) (2003 – 2008)

CAS Number 173159-57-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2253
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2534
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2421
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	283
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	334
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	364
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	652
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	688
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	362
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1318
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1512
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1695
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1096
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1203
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1204
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1157
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1331
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1217
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	586
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	632
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	486
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	584
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	711
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	522
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	934
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	990
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1004

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Halosulfuron (2003 – 2008)

CAS Number 135397-30-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2356
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2485
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2530
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	291
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	331
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	377
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	672
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	679
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	385
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1393
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1475
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1768
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1148
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1184
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1261
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1208
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1301
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1269
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	592
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	650
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	485
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	609
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	694
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	565
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1005
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	950
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1068

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Halosulfuron (creatinine corrected) (2003 – 2008)

CAS Number 135397-30-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2354
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2485
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2528
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	291
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	331
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	377
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	671
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	679
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	383
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1392
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1475
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1768
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1147
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1184
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1260
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1207
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1301
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1268
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	591
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	650
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	484
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	609
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	694
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	564
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1004
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	950
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1068

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Mesosulfuron-methyl (2003 – 2008)

CAS Number 208465-21-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2427
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2494
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	302
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	372
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	694
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	371
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1431
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1751
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1189
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1245
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1238
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1249
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	596
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	465
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	634
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	554
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1039
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1059

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.06, 0.06, and 0.06 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Mesosulfuron-methyl (creatinine corrected) (2003 – 2008)

CAS Number 208465-21-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2425
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2492
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	302
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	372
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	693
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	369
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1430
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1751
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1188
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1244
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1237
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1248
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	595
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	464
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	634
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	553
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1038
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1059

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Metsulfuron-methyl (2003 – 2008)

CAS Number 74223-64-6

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2360
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2494
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	297
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	373
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	675
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	374
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1388
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1747
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1152
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1246
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1208
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1248
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	595
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	470
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	596
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	538
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1013
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1066

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.05, 0.05, and 0.05 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Metsulfuron-methyl (creatinine corrected) (2003 – 2008)

CAS Number 74223-64-6

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2358
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2492
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	297
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	373
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	674
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	372
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1387
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1747
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1151
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1245
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1207
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1247
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	594
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	469
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	596
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	537
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1012
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1066

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Nicosulfuron (2003 – 2008)

CAS Number 111991-09-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2322
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2570
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2422
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	296
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	341
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	363
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	666
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	699
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	364
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1360
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1530
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1695
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1131
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1222
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1210
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1191
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1348
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1212
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	589
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	656
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	486
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	601
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	719
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	524
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	980
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	993
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1007

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Nicosulfuron (creatinine corrected) (2003 – 2008)

CAS Number 111991-09-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2320
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2570
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2420
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	296
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	341
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	363
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	665
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	699
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	362
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1359
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1530
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1695
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1130
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1222
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1209
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1190
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1348
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1211
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	588
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	656
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	485
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	601
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	719
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	523
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	979
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	993
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1007

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Oxasulfuron (2003 – 2008)

CAS Number 144651-06-9

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2355
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2540
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	290
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	379
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	672
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	381
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1393
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1780
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1150
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1269
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1205
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1271
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	579
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	487
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	616
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	567
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1018
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1076

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.06, 0.06, and 0.06 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Oxasulfuron (creatinine corrected) (2003 – 2008)

CAS Number 144651-06-9

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2353
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2538
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	290
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	379
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	671
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	379
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1392
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1780
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1149
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1268
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1204
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1270
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	578
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	486
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	616
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	566
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1017
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1076

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Primisulfuron-methyl (2003 – 2008)

CAS Number 86209-51-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2250
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2455
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2422
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	285
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	327
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	356
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	627
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	665
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	376
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1338
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1463
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1690
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1107
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1160
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1207
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1143
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1295
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1215
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	574
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	667
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	456
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	556
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	661
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	549
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	975
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	938
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1030

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.07, 0.07, and 0.07 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Primisulfuron-methyl (creatinine corrected) (2003 – 2008)

CAS Number 86209-51-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2249
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2455
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2420
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	285
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	327
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	356
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	626
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	665
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	374
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1338
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1463
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1690
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1107
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1160
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1206
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1142
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1295
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1214
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	573
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	667
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	455
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	556
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	661
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	548
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	975
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	938
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1030

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Prosulfuron (2003 – 2008)

CAS Number 94125-34-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2247
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2461
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2566
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	284
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	326
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	380
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	640
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	676
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	386
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1323
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1459
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1800
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1100
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1165
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1285
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1147
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1296
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1281
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	589
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	673
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	491
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	565
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	677
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	570
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	940
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	924
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1081

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.05, 0.05, and 0.05 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Prosulfuron (creatinine corrected) (2003 – 2008)

CAS Number 94125-34-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2245
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2461
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2564
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	284
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	326
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	380
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	639
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	676
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1322
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1459
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1800
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1099
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1165
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1284
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1146
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1296
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1280
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	588
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	673
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	490
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	565
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	677
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	569
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	939
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	924
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1081

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Rimsulfuron (2003 – 2008)

CAS Number 122931-48-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2284
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2593
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2530
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	279
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	346
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	376
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	654
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	706
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	383
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1351
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1541
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1771
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1110
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1224
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1271
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1174
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1369
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1259
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	561
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	675
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	463
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	592
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	715
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	985
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	998
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1080

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.05, 0.05, and 0.05 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Rimsulfuron (creatinine corrected) (2003 – 2008)

CAS Number 122931-48-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2282
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2593
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2528
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	279
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	346
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	376
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	653
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	706
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	381
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1350
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1541
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1771
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1109
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1224
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1270
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1173
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1369
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1258
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	560
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	675
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	462
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	592
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	715
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	567
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	984
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	998
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1080

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Sulfometuron-methyl (2003 – 2008)

CAS Number 74222-97-2

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2067
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2598
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2458
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	252
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	345
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	352
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	587
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	710
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	373
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1228
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1543
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1733
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1007
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1233
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1226
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1060
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1365
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1232
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	441
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	454
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	569
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	698
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	557
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	916
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	996
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1045

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.05, 0.05, and 0.05 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Sulfometuron-methyl (creatinine corrected) (2003 – 2008)

CAS Number 74222-97-2

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2065
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2598
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2456
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	252
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	345
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	352
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	586
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	710
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	371
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1227
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1543
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1733
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1006
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1233
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1225
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1059
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1365
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1231
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	440
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	453
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	569
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	698
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	556
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	915
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	996
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1045

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Sulfosulfuron (2003 – 2008)

CAS Number 141776-32-1

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2391
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2593
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2530
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	294
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	344
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	377
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	681
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	708
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	385
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1416
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1541
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1768
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1170
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1230
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1261
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1221
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1363
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1269
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	594
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	673
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	485
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	617
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	719
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	565
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1026
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	997
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1068

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Sulfosulfuron (creatinine corrected) (2003 – 2008)

CAS Number 141776-32-1

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2389
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2593
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2528
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	294
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	344
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	377
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	680
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	708
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	383
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1415
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1541
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1768
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1169
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1230
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1260
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1220
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1363
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1268
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	593
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	673
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	484
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	617
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	719
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	564
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1025
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	997
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1068

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Thifensulfuron-methyl (2003 – 2008)

CAS Number 79277-27-3

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2355
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2495
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	291
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	370
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	677
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	375
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1387
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1750
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1145
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1252
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1210
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1243
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	566
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	479
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	616
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	542
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1022
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1056

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.08, 0.08, and 0.08 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Thifensulfuron-methyl (creatinine corrected) (2003 – 2008)

CAS Number 79277-27-3

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2353
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2634
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2493
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	291
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	350
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	370
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	676
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	373
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1386
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1566
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1750
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1144
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1247
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1251
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1209
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1387
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1242
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	565
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	697
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	478
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	616
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	541
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1021
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1056

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Triasulfuron (2003 – 2008)

CAS Number 82097-50-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2250
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2557
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2530
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	278
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	341
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	378
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	643
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	385
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1329
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1521
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1767
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1101
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1210
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1265
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1149
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1347
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1265
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	549
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	677
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	488
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	580
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	713
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	547
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	973
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	968
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1073

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.07, 0.07, and 0.07 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Triasulfuron (creatinine corrected) (2003 – 2008)

CAS Number 82097-50-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2248
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2557
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2528
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	278
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	341
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	378
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	642
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	383
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1328
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1521
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1767
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1100
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1210
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1264
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1148
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1347
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1264
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	548
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	677
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	487
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	580
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	713
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	546
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	972
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	968
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1073

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Triflusaluron-methyl (2003 – 2008)

CAS Number 126535-15-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2427
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2562
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2494
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	302
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	340
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	374
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	694
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	381
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1431
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1520
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1739
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1189
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1216
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1240
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1238
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1346
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1254
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	596
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	693
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	477
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	634
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	699
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	558
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1039
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	972
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1053

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.05, 0.05, and 0.05 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary Triflurosulfuron-methyl (creatinine corrected) (2003 – 2008)

CAS Number 126535-15-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2425
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2562
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2492
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	302
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	340
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	374
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	693
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	379
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1430
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1520
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1739
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1188
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1216
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1239
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1237
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1346
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1253
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	595
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	693
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	476
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	634
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	699
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	557
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1038
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	972
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1053

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/SulfonylureaHerbicides_BiomonitoringSummary.html

Urinary N,N-diethyl-meta-toluamide (DEET) (2007 – 2010)

CAS Number 134-62-3

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2565
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2744
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	380
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	386
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	386
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	400
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1169
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1307
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	630
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	651
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1286
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1279
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1401
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	499
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	600
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	570
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	504
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1071
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1199

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 and 09-10 are 0.083 and 0.083.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary N,N-diethyl-meta-toluamide (DEET) (2011 – 2014)‡

CAS Number 134-62-3

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2430
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	.103 (<LOD-.269)	2667
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	402
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.205 (<LOD-.792)	421
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	390
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.108 (<LOD-.161)	427
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1638
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	.099 (<LOD-.269)	1819
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	.085 (<LOD-.162)	1232
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	.115 (<LOD-.510)	1345
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1198
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	.091 (<LOD-.155)	1322
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	289
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	427
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	670
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	588
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	784
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	.123 (<LOD-.431)	1016
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	.094 (<LOD-.294)	557
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	670
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	331
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.132 (<LOD-.518)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.083 and 0.083, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2013-2014.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary N,N-diethyl-meta-toluamide (DEET) (creatinine corrected) (2007 – 2010)

CAS Number 134-62-3

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2563
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2744
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	380
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	386
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	400
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1169
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1307
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	630
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	651
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1285
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1278
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1401
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	498
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	600
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	569
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	504
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1071
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1199

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary N,N-diethyl-meta-toluamide (DEET) (creatinine corrected) (2011 – 2014)‡

CAS Number 134-62-3

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2430
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	.294 (<LOD-.367)	2665
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	402
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.666 (<LOD-1.17)	421
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	390
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.210 (<LOD-.489)	427
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1638
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	.280 (<LOD-.355)	1817
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	.267 (<LOD-.345)	1232
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	.267 (<LOD-.618)	1344
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1198
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	.309 (<LOD-.367)	1321
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	289
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	425
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	670
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	588
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	784
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	.317 (<LOD-.587)	1016
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	.255 (<LOD-.367)	557
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	668
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	331
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.489 (<LOD-.534)	291

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2013-2014.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary 3-(Diethylcarbamoyl) benzoic acid (DCBA) (2007 – 2010)

CAS Number 858981-15-4

Metabolite of DEET

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	3.50 (2.64-4.64)	2.37 (1.88-3.10)	9.14 (5.61-14.5)	33.9 (20.5-53.1)	79.2 (37.9-145)	2538
Total population (2009 - 2010)	4.54 (3.35-6.15)	3.40 (2.31-4.95)	13.8 (8.63-20.6)	51.9 (31.1-108)	165 (57.8-464)	2735
Age 6-11 years (2007 - 2008)	4.44 (3.73-5.29)	3.44 (2.70-5.87)	12.7 (9.54-15.9)	42.0 (24.2-70.4)	79.7 (44.9-114)	378
Age 6-11 years (2009 - 2010)	6.44 (3.72-11.1)	5.35 (2.58-8.86)	18.5 (8.15-37.9)	83.8 (28.4-439)	316 (41.2-3970)	385
Age 12-19 years (2007 - 2008)	5.26 (3.47-7.98)	4.37 (2.68-5.98)	13.1 (6.81-25.8)	35.4 (20.4-71.2)	71.2 (30.7-700)	380
Age 12-19 years (2009 - 2010)	6.58 (4.49-9.66)	4.63 (2.82-8.64)	18.9 (10.7-33.6)	87.8 (32.9-186)	186 (31.1-1130)	398
Age 20-59 years (2007 - 2008)	3.33 (2.56-4.35)	2.23 (1.83-2.90)	7.95 (5.05-14.5)	30.8 (17.4-53.1)	75.6 (39.3-131)	1157
Age 20-59 years (2009 - 2010)	4.39 (3.29-5.86)	3.33 (2.23-4.95)	14.0 (8.36-20.9)	51.4 (32.6-95.8)	138 (52.9-280)	1300
Age 60+ years (2007 - 2008)	2.78 (1.75-4.42)	1.64 (.936-3.06)	6.15 (3.08-16.9)	34.7 (16.3-75.4)	103 (32.4-200)	623
Age 60+ years (2009 - 2010)	3.42 (2.39-4.91)	2.13 (1.45-4.00)	9.63 (5.33-17.1)	35.4 (19.7-63.8)	103 (43.2-346)	652
Males (2007 - 2008)	4.15 (2.88-6.00)	2.90 (2.13-4.34)	11.3 (6.63-19.7)	37.7 (20.7-82.0)	112 (34.7-556)	1269
Males (2009 - 2010)	5.58 (3.94-7.90)	4.39 (2.67-6.24)	18.7 (10.8-30.6)	78.3 (37.3-174)	199 (96.2-525)	1340
Females (2007 - 2008)	2.97 (2.32-3.80)	2.06 (1.64-2.59)	6.84 (4.41-10.8)	30.8 (15.0-40.8)	52.6 (36.4-103)	1269
Females (2009 - 2010)	3.73 (2.79-4.98)	2.76 (1.87-4.24)	9.91 (6.35-15.9)	36.2 (22.4-70.4)	94.9 (40.2-278)	1395
Mexican Americans (2007 - 2008)	3.70 (2.57-5.33)	3.26 (1.87-5.17)	9.63 (5.93-17.6)	28.0 (14.7-69.1)	69.1 (27.5-133)	490
Mexican Americans (2009 - 2010)	2.63 (1.61-4.28)	2.03 (.932-4.71)	7.35 (4.22-14.5)	23.1 (12.5-48.2)	48.9 (26.0-94.3)	599
Non-Hispanic blacks (2007 - 2008)	4.36 (3.18-5.96)	3.54 (2.24-6.04)	10.3 (6.78-17.4)	31.9 (19.3-51.6)	62.4 (40.4-103)	562
Non-Hispanic blacks (2009 - 2010)	3.91 (2.85-5.35)	3.22 (2.24-4.75)	9.53 (5.88-14.4)	23.4 (18.0-33.4)	38.4 (29.1-60.5)	497
Non-Hispanic whites (2007 - 2008)	3.47 (2.35-5.14)	2.22 (1.65-3.19)	9.12 (4.82-17.0)	36.5 (17.7-82.0)	86.9 (32.9-356)	1064
Non-Hispanic whites (2009 - 2010)	5.48 (3.83-7.84)	4.31 (2.64-6.25)	17.7 (10.5-28.4)	67.9 (32.6-195)	200 (63.8-832)	1199

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 and 09-10 are 0.93 and 0.475.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary 3-(Diethylcarbamoyl) benzoic acid (DCBA) (2011 – 2014)

CAS Number 858981-15-4

Metabolite of DEET

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	2.49 (1.88-3.29)	1.95 (1.45-2.59)	6.47 (4.52-8.28)	20.8 (12.6-42.0)	61.1 (25.2-181)	2426
Total population (2013 - 2014)	2.46 (1.84-3.30)	1.77 (1.34-2.30)	6.26 (4.10-9.15)	25.0 (13.2-46.1)	75.9 (31.7-218)	2663
Age 6-11 years (2011 - 2012)	4.24 (2.76-6.53)	3.84 (2.32-6.11)	11.8 (7.06-17.2)	27.5 (17.7-84.9)	100 (24.6-448)	400
Age 6-11 years (2013 - 2014)	4.82 (3.20-7.25)	3.64 (2.50-5.02)	11.4 (6.46-19.3)	41.6 (17.1-223)	202 (37.9-649)	420
Age 12-19 years (2011 - 2012)	3.91 (3.03-5.04)	3.46 (2.42-4.00)	9.64 (6.42-14.7)	25.0 (16.9-43.0)	60.1 (26.4-161)	390
Age 12-19 years (2013 - 2014)	4.41 (2.95-6.59)	3.71 (2.58-7.24)	12.2 (7.70-19.1)	37.4 (19.1-79.7)	96.0 (37.7-172)	427
Age 20+ years (2011 - 2012)	2.19 (1.66-2.90)	1.63 (1.22-2.21)	5.43 (3.64-7.44)	18.8 (10.4-38.4)	55.4 (23.9-159)	1636
Age 20+ years (2013 - 2014)	2.10 (1.55-2.86)	1.40 (1.10-1.84)	4.91 (3.21-7.99)	20.4 (10.7-40.1)	60.9 (26.0-221)	1816
Males (2011 - 2012)	2.87 (2.12-3.90)	2.42 (1.74-3.45)	7.31 (5.05-10.4)	25.2 (12.6-51.1)	57.3 (25.7-198)	1230
Males (2013 - 2014)	2.94 (2.08-4.17)	2.10 (1.57-2.72)	7.41 (4.62-12.3)	31.5 (15.4-81.2)	103 (39.9-325)	1343
Females (2011 - 2012)	2.17 (1.63-2.90)	1.60 (1.20-2.12)	5.32 (3.54-7.44)	17.7 (9.64-42.7)	63.7 (17.7-242)	1196
Females (2013 - 2014)	2.07 (1.59-2.71)	1.52 (1.11-1.91)	5.13 (3.67-7.99)	18.9 (9.44-38.6)	43.8 (23.9-138)	1320
Mexican Americans (2011 - 2012)	2.62 (1.15-5.96)	2.11 (.605-7.86)	8.37 (3.43-22.0)	32.9 (12.9-100)	75.6 (15.9-481)	289
Mexican Americans (2013 - 2014)	2.27 (1.58-3.26)	1.89 (1.03-2.91)	7.62 (3.80-10.3)	17.2 (11.0-26.0)	35.8 (18.8-106)	427
Non-Hispanic blacks (2011 - 2012)	3.32 (2.41-4.57)	2.71 (2.08-3.55)	8.08 (4.73-12.2)	22.5 (11.4-55.1)	53.5 (22.5-157)	667
Non-Hispanic blacks (2013 - 2014)	2.56 (1.94-3.38)	2.18 (1.69-2.89)	5.54 (3.93-7.95)	16.0 (8.88-34.7)	35.7 (17.4-83.5)	585
Non-Hispanic whites (2011 - 2012)	2.36 (1.71-3.28)	1.83 (1.39-2.50)	5.80 (3.89-8.10)	18.0 (9.01-53.0)	62.3 (16.9-252)	783
Non-Hispanic whites (2013 - 2014)	2.62 (1.77-3.87)	1.72 (1.15-2.54)	6.96 (3.80-12.8)	31.5 (13.5-93.4)	103 (37.7-373)	1016
All Hispanics (2011 - 2012)	2.85 (1.59-5.12)	2.11 (.964-4.45)	7.94 (3.77-15.9)	35.9 (14.8-100)	152 (24.6-481)	558
All Hispanics (2013 - 2014)	2.12 (1.57-2.86)	1.73 (1.12-2.54)	5.68 (3.51-8.32)	15.7 (11.0-22.8)	26.6 (18.8-68.7)	670
Asians (2011 - 2012)	1.40 (.933-2.09)	.959 (.544-1.88)	3.27 (1.80-7.62)	12.7 (6.77-28.8)	28.8 (13.3-50.2)	330
Asians (2013 - 2014)	1.68 (1.23-2.31)	1.02 (.656-1.54)	3.94 (2.14-6.41)	18.7 (10.8-44.6)	82.7 (26.5-251)	290

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.475 and 0.475, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary 3-(Diethylcarbamoyl) benzoic acid (DCBA) (creatinine corrected) (2007 – 2010)

CAS Number 858981-15-4

Metabolite of DEET

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	3.60 (2.79-4.65)	2.79 (2.14-3.55)	8.55 (5.49-13.2)	27.3 (17.8-47.9)	70.8 (34.1-170)	2537
Total population (2009 - 2010)	4.74 (3.48-6.46)	3.35 (2.30-5.26)	12.9 (8.53-20.6)	44.6 (28.3-86.3)	131 (47.0-405)	2735
Age 6-11 years (2007 - 2008)	5.64 (4.72-6.75)	4.84 (3.65-5.78)	14.2 (10.7-19.8)	47.7 (34.2-55.1)	88.6 (47.9-182)	378
Age 6-11 years (2009 - 2010)	8.72 (5.03-15.1)	6.42 (4.02-11.6)	23.5 (13.2-36.7)	75.4 (28.6-673)	365 (46.2-4980)	385
Age 12-19 years (2007 - 2008)	4.08 (2.81-5.93)	2.96 (2.14-5.36)	11.0 (6.38-16.0)	24.3 (14.8-53.4)	53.4 (19.3-345)	379
Age 12-19 years (2009 - 2010)	5.65 (3.76-8.50)	3.76 (2.56-6.22)	16.5 (7.29-31.7)	68.6 (25.3-182)	154 (25.3-1270)	398
Age 20-59 years (2007 - 2008)	3.34 (2.61-4.27)	2.73 (1.99-3.46)	7.57 (4.92-12.1)	24.8 (14.9-44.7)	57.8 (30.9-117)	1157
Age 20-59 years (2009 - 2010)	4.41 (3.25-5.97)	2.98 (2.11-5.32)	11.7 (7.71-19.6)	39.1 (24.7-82.6)	112 (51.3-228)	1300
Age 60+ years (2007 - 2008)	3.42 (2.33-5.02)	2.47 (1.45-3.64)	7.33 (4.25-16.8)	33.8 (15.9-86.0)	93.3 (34.2-244)	623
Age 60+ years (2009 - 2010)	4.06 (2.95-5.59)	2.68 (2.10-3.96)	10.8 (6.79-15.9)	37.7 (22.2-51.1)	108 (42.7-393)	652
Males (2007 - 2008)	3.46 (2.46-4.87)	2.72 (1.76-3.73)	8.68 (5.34-14.4)	27.8 (16.9-69.4)	87.0 (27.8-403)	1269
Males (2009 - 2010)	4.97 (3.49-7.08)	3.29 (2.14-5.94)	14.7 (9.13-24.0)	60.0 (28.5-134)	185 (74.8-433)	1340
Females (2007 - 2008)	3.74 (2.99-4.68)	2.88 (2.27-3.63)	8.55 (5.36-13.2)	27.2 (16.2-46.3)	54.8 (34.2-117)	1268
Females (2009 - 2010)	4.54 (3.40-6.05)	3.35 (2.39-4.67)	11.8 (7.55-18.4)	35.3 (24.2-53.4)	77.6 (36.7-252)	1395
Mexican Americans (2007 - 2008)	3.79 (2.57-5.58)	3.60 (1.99-5.96)	9.91 (6.55-16.9)	27.8 (15.0-60.6)	60.6 (24.4-107)	490
Mexican Americans (2009 - 2010)	2.74 (1.75-4.28)	2.03 (1.12-5.18)	7.57 (3.92-14.0)	23.3 (13.6-31.8)	37.4 (23.6-90.5)	599
Non-Hispanic blacks (2007 - 2008)	3.33 (2.46-4.49)	2.74 (1.91-3.76)	7.07 (4.88-11.9)	22.5 (12.6-45.1)	53.9 (28.7-103)	561
Non-Hispanic blacks (2009 - 2010)	2.98 (2.26-3.94)	2.41 (1.70-3.37)	6.73 (4.34-9.46)	16.5 (13.0-20.4)	30.6 (19.4-51.1)	497
Non-Hispanic whites (2007 - 2008)	3.78 (2.69-5.32)	2.82 (2.05-4.02)	8.70 (5.23-14.9)	30.7 (16.7-57.2)	76.9 (26.7-432)	1064
Non-Hispanic whites (2009 - 2010)	5.97 (4.13-8.64)	4.41 (2.61-7.43)	17.4 (10.7-26.7)	61.1 (29.0-189)	189 (56.4-849)	1199

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary 3-(Diethylcarbamoyl) benzoic acid (DCBA) (creatinine corrected) (2011 – 2014)

CAS Number 858981-15-4

Metabolite of DEET

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	2.61 (1.96-3.46)	2.07 (1.59-2.63)	5.40 (3.90-7.83)	19.0 (12.7-36.4)	60.1 (22.5-150)	2426
Total population (2013 - 2014)	2.63 (1.94-3.56)	1.85 (1.47-2.26)	5.24 (3.92-7.72)	23.8 (10.3-55.1)	68.9 (26.9-223)	2661
Age 6-11 years (2011 - 2012)	5.96 (3.63-9.80)	5.22 (3.17-7.29)	15.9 (7.97-21.5)	43.3 (18.5-208)	105 (38.0-1120)	400
Age 6-11 years (2013 - 2014)	6.21 (4.04-9.55)	4.14 (2.92-5.43)	13.5 (7.13-28.5)	62.2 (23.4-251)	251 (62.2-1060)	420
Age 12-19 years (2011 - 2012)	3.49 (2.71-4.49)	3.07 (2.40-3.69)	6.86 (5.21-10.5)	21.3 (13.2-40.3)	44.2 (17.4-203)	390
Age 12-19 years (2013 - 2014)	3.77 (2.49-5.72)	3.36 (2.02-4.98)	7.08 (5.05-17.1)	34.0 (12.6-86.6)	86.6 (31.1-198)	427
Age 20+ years (2011 - 2012)	2.27 (1.72-3.01)	1.79 (1.34-2.42)	4.36 (3.29-6.53)	15.6 (10.5-28.5)	59.3 (21.1-112)	1636
Age 20+ years (2013 - 2014)	2.27 (1.67-3.08)	1.53 (1.30-1.85)	4.43 (3.23-6.48)	18.1 (8.08-46.6)	53.0 (20.3-212)	1814
Males (2011 - 2012)	2.62 (1.89-3.63)	2.07 (1.51-2.80)	6.06 (3.88-9.34)	19.3 (13.0-31.0)	55.8 (19.4-176)	1230
Males (2013 - 2014)	2.69 (1.84-3.93)	1.87 (1.35-2.39)	6.08 (3.85-9.76)	30.8 (12.5-64.2)	86.6 (38.8-347)	1342
Females (2011 - 2012)	2.59 (1.97-3.42)	2.07 (1.60-2.66)	5.18 (3.77-7.04)	17.8 (10.4-45.1)	61.4 (19.3-112)	1196
Females (2013 - 2014)	2.57 (1.98-3.33)	1.82 (1.53-2.17)	4.96 (3.92-6.40)	19.9 (7.90-45.7)	47.7 (23.2-205)	1319
Mexican Americans (2011 - 2012)	2.61 (1.12-6.06)	2.23 (.632-8.29)	8.29 (3.05-20.9)	27.9 (8.78-126)	66.3 (11.2-360)	289
Mexican Americans (2013 - 2014)	2.32 (1.63-3.30)	2.01 (1.32-2.94)	5.87 (3.92-8.12)	16.6 (8.35-34.9)	38.2 (16.6-88.2)	425
Non-Hispanic blacks (2011 - 2012)	2.45 (1.80-3.33)	2.04 (1.52-2.56)	4.78 (3.20-8.50)	14.2 (8.73-27.3)	28.8 (14.8-94.6)	667
Non-Hispanic blacks (2013 - 2014)	1.97 (1.46-2.66)	1.50 (1.05-2.57)	4.61 (2.97-5.75)	10.3 (6.48-23.4)	25.4 (10.8-78.8)	585
Non-Hispanic whites (2011 - 2012)	2.64 (1.89-3.67)	2.08 (1.54-3.01)	5.17 (3.72-7.29)	19.3 (11.5-46.0)	62.3 (17.4-167)	783
Non-Hispanic whites (2013 - 2014)	2.96 (1.99-4.41)	1.89 (1.42-2.58)	5.87 (3.83-12.2)	33.0 (12.1-103)	118 (36.0-598)	1016
All Hispanics (2011 - 2012)	2.87 (1.59-5.16)	2.18 (1.10-4.73)	8.13 (3.71-14.4)	27.1 (11.2-104)	104 (19.0-830)	558
All Hispanics (2013 - 2014)	2.18 (1.63-2.92)	1.78 (1.44-2.32)	4.88 (3.47-6.48)	13.3 (7.83-23.4)	30.2 (16.6-54.6)	668
Asians (2011 - 2012)	1.85 (1.26-2.73)	1.40 (.933-2.24)	3.95 (2.25-8.68)	13.7 (7.88-33.3)	33.3 (14.8-55.8)	330
Asians (2013 - 2014)	2.13 (1.52-2.99)	1.29 (1.02-1.81)	4.19 (2.75-7.36)	21.1 (9.36-46.6)	89.2 (35.3-426)	290

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary N,N-Diethyl-3-(hydroxymethyl) benzamide (DHMB) (2007 – 2010)

CAS Number 72236-22-7

Metabolite of DEET

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	.229 (<LOD-.525)	.780 (.326-1.51)	2562
Total population (2009 - 2010)	*	< LOD	< LOD	.455 (.162-.956)	1.34 (.644-3.10)	2736
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.275 (.168-.433)	.640 (.264-2.64)	380
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.655 (<LOD-2.93)	2.82 (.205-24.6)	385
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.356 (<LOD-.879)	.665 (.165-8.14)	386
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	.472 (<LOD-1.59)	1.20 (.201-4.11)	398
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	.188 (<LOD-.413)	.767 (.335-1.30)	1167
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	.498 (.172-.956)	1.34 (.729-2.29)	1304
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	.256 (<LOD-.787)	.787 (.194-1.81)	629
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	.257 (.106-.512)	.840 (.521-2.46)	649
Males (2007 - 2008)	*	< LOD	< LOD	.325 (.091-.909)	1.05 (.249-4.86)	1283
Males (2009 - 2010)	*	< LOD	< LOD	.744 (.323-1.43)	1.81 (.946-3.94)	1339
Females (2007 - 2008)	*	< LOD	< LOD	.165 (<LOD-.326)	.512 (.256-.968)	1279
Females (2009 - 2010)	*	< LOD	< LOD	.220 (<LOD-.521)	.796 (.329-2.05)	1397
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.216 (.092-.509)	.509 (.207-.989)	499
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.228 (<LOD-.504)	.507 (.223-.866)	598
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.310 (.091-.470)	.640 (.378-1.29)	567
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.135 (<LOD-.292)	.449 (.212-.884)	503
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.255 (<LOD-.861)	.884 (.225-4.84)	1071
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.644 (.182-1.34)	1.89 (.770-5.34)	1195

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 and 09-10 are 0.089 and 0.089.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary N,N-Diethyl-3-(hydroxymethyl) benzamide (DHMB) (2011 – 2014)

CAS Number 72236-22-7

Metabolite of DEET

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	.536 (<LOD-1.46)	2419
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	.737 (.168-2.11)	2659
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	.683 (<LOD-1.63)	400
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	.285 (<LOD-1.55)	1.45 (.265-6.31)	420
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	.526 (.181-.966)	389
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.701 (.177-1.33)	424
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	.536 (<LOD-1.47)	1630
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	.613 (<LOD-2.25)	1815
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	.647 (.185-1.46)	1230
Males (2013 - 2014)	*	< LOD	< LOD	.175 (<LOD-.737)	.916 (.249-2.76)	1338
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	.337 (<LOD-1.71)	1189
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	.366 (<LOD-1.21)	1321
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	.790 (<LOD-1.20)	288
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	.169 (<LOD-.518)	425
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	.475 (<LOD-1.19)	668
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	.423 (<LOD-1.60)	586
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	.631 (<LOD-2.24)	778
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.188 (<LOD-.840)	.933 (.285-3.40)	1013
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	.964 (<LOD-2.76)	555
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	668
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	.125 (<LOD-.372)	330
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.651 (<LOD-3.23)	290

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.089 and 0.089, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary N,N-Diethyl-3-(hydroxymethyl) benzamide (DHMB) (creatinine corrected) (2007 – 2010)

CAS Number 72236-22-7

Metabolite of DEET

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	.331 (<LOD-.452)	.628 (.393-1.32)	2560
Total population (2009 - 2010)	*	< LOD	< LOD	.449 (.300-.720)	1.13 (.548-2.41)	2736
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.370 (.289-.524)	.831 (.347-1.37)	380
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.572 (<LOD-3.40)	3.12 (.370-18.4)	385
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.253 (<LOD-.555)	.544 (.191-1.76)	384
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	.436 (<LOD-.869)	.869 (.246-8.42)	398
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	.331 (<LOD-.441)	.582 (.441-.866)	1167
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	.468 (.300-.702)	1.10 (.572-1.79)	1304
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	.394 (<LOD-.701)	1.01 (.389-2.48)	629
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	.395 (.315-.489)	.875 (.548-2.41)	649
Males (2007 - 2008)	*	< LOD	< LOD	.300 (.176-.826)	.866 (.304-3.33)	1282
Males (2009 - 2010)	*	< LOD	< LOD	.524 (.280-1.39)	1.45 (.718-3.16)	1339
Females (2007 - 2008)	*	< LOD	< LOD	.341 (<LOD-.393)	.572 (.419-.734)	1278
Females (2009 - 2010)	*	< LOD	< LOD	.419 (<LOD-.488)	.723 (.458-1.85)	1397
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.315 (.203-.446)	.467 (.337-.720)	498
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.297 (<LOD-.401)	.415 (.299-.718)	598
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.234 (.175-.411)	.487 (.315-1.05)	566
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.221 (<LOD-.262)	.362 (.246-.648)	503
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.343 (<LOD-.583)	.826 (.349-2.99)	1071
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.531 (.305-1.36)	1.59 (.524-5.83)	1195

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary N,N-Diethyl-3-(hydroxymethyl) benzamide (DHMB) (creatinine corrected) (2011 – 2014)

CAS Number 72236-22-7

Metabolite of DEET

Geometric mean and selected percentiles of concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	.661 (<LOD-1.37)	2419
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	.721 (.346-2.03)	2657
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	1.05 (<LOD-6.45)	400
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	.573 (<LOD-1.40)	1.69 (.594-7.63)	420
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	.405 (.252-1.08)	389
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.580 (.332-1.23)	424
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	.661 (<LOD-1.37)	1630
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	.629 (<LOD-2.11)	1813
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	.743 (.331-1.51)	1230
Males (2013 - 2014)	*	< LOD	< LOD	.315 (<LOD-.661)	1.03 (.393-3.94)	1337
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	.617 (<LOD-1.29)	1189
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	.542 (<LOD-1.61)	1320
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	.786 (<LOD-1.29)	288
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	.370 (<LOD-.676)	423
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	.415 (<LOD-.954)	668
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	.333 (<LOD-1.12)	586
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	.699 (<LOD-1.51)	778
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.393 (<LOD-.886)	1.03 (.419-4.64)	1013
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	.798 (<LOD-1.64)	555
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	666
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	.490 (<LOD-.786)	330
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.572 (<LOD-3.14)	290

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEET_BiomonitoringSummary.html

Urinary Carbofuranphenol (1999 – 2004)

CAS Number 1563-38-8

Metabolite of Benfuracarb, Carbofuran, Carbosulfan, and Furathiocar

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	.770 (<LOD-1.30)	1994
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3030
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2390
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	.450 (<LOD-2.20)	482
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	578
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	293
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	.570 (<LOD-1.20)	681
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	827
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	684
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	.840 (<LOD-1.50)	831
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1125
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	902
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	500
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	511
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	.740 (<LOD-1.50)	973
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1423
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1164
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	.840 (<LOD-1.50)	1021
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1607
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1226
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	.590 (<LOD-2.00)	1.90 (<LOD-5.10)	696
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	765
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	.550 (<LOD-1.60)	521
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	770
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	613
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	.740 (<LOD-1.50)	603
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1272
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1054

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 0.4, 0.4, and 0.4 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Carbofuran_BiomonitoringSummary.html

Urinary Carbofuranphenol (creatinine corrected) (1999 – 2004)

CAS Number 1563-38-8

Metabolite of Benfuracarb, Carbofuran, Carbosulfan, and Furathiocar

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	.778 (<LOD-1.00)	1994
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3029
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2388
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	.988 (<LOD-2.80)	482
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	578
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	293
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	.482 (<LOD-.853)	681
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	826
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	683
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	.875 (<LOD-1.06)	831
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1125
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	901
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	500
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	511
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	.667 (<LOD-1.08)	973
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1423
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1163
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	.881 (<LOD-1.13)	1021
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1606
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1225
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	.778 (<LOD-1.94)	1.83 (<LOD-4.16)	696
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	765
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	567
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	.700 (<LOD-1.08)	521
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	769
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	613
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	.737 (<LOD-.929)	603
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1272
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1053

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Carbofuran_BiomonitoringSummary.html

Urinary 2-Isopropoxyphenol (1999 – 2004)

CAS Number 4812-20-8

Metabolite of Propoxur

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1917
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2994
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2387
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	456
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	574
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	295
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	655
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	820
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	686
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	806
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1109
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	900
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	491
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	506
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	936
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1406
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1161
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	981
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1588
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1226
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	664
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	762
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	594
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	500
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	770
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	601
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	585
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1241
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1041

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, and 03-04 are 1.1, 0.4, and 0.4 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Propoxur_BiomonitoringSummary.html

Urinary 2-Isopropoxyphenol (creatinine corrected) (1999 – 2004)

CAS Number 4812-20-8

Metabolite of Propoxur

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1917
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2993
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2385
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	456
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	574
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	295
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	655
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	819
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	685
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	806
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1109
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	899
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	491
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	506
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	936
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1406
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1160
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	981
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1587
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1225
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	664
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	762
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	593
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	500
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	769
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	601
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	585
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1241
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1040

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Propoxur_BiomonitoringSummary.html

Urinary 2,4,5-Trichlorophenol (2003 – 2010)‡

CAS Number 95-95-4

Metabolite of Several Organochlorine Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	.100 (.100-.100)	.200 (.200-.300)	.400 (.300-.400)	2525
Total population (2005 - 2006)	*	< LOD	.100 (.100-.200)	.300 (.200-.300)	.400 (.300-.500)	2548
Total population (2007 - 2008)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.200)	.300 (.200-.300)	2604
Total population (2009 - 2010)	*	< LOD	< LOD	.200 (.200-.200)	.300 (.200-.300)	2749
Age 6-11 years (2003 - 2004)	*	< LOD	.100 (.100-.200)	.200 (.200-.300)	.300 (.200-.500)	314
Age 6-11 years (2005 - 2006)	*	< LOD	.100 (.100-.200)	.300 (.200-.400)	.400 (.300-.500)	356
Age 6-11 years (2007 - 2008)	*	< LOD	.100 (<LOD-.100)	.200 (.100-.300)	.300 (.200-.500)	389
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.300)	415
Age 12-19 years (2003 - 2004)	*	< LOD	.100 (.100-.200)	.200 (.200-.300)	.300 (.200-.500)	722
Age 12-19 years (2005 - 2006)	*	< LOD	.100 (.100-.200)	.300 (.200-.300)	.400 (.300-.500)	702
Age 12-19 years (2007 - 2008)	*	< LOD	.100 (<LOD-.100)	.200 (.100-.200)	.200 (.200-.500)	401
Age 12-19 years (2009 - 2010)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.500)	420
Age 20+ years (2003 - 2004)	*	< LOD	.100 (.100-.100)	.300 (.200-.300)	.400 (.300-.500)	1489
Age 20+ years (2005 - 2006)	*	< LOD	.100 (.100-.200)	.300 (.200-.300)	.400 (.300-.500)	1490
Age 20+ years (2007 - 2008)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.400)	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	.200 (.200-.200)	.300 (.200-.300)	1914
Males (2003 - 2004)	*	< LOD	.100 (.100-.100)	.200 (.200-.300)	.400 (.300-.400)	1231
Males (2005 - 2006)	*	< LOD	.100 (.100-.200)	.200 (.200-.300)	.400 (.300-.500)	1270
Males (2007 - 2008)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.200)	.300 (.200-.300)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.200 (.200-.200)	.300 (.200-.300)	1399
Females (2003 - 2004)	*	< LOD	.100 (.100-.200)	.200 (.200-.300)	.400 (.300-.400)	1294
Females (2005 - 2006)	*	< LOD	.100 (.100-.200)	.300 (.200-.400)	.500 (.300-.500)	1278
Females (2007 - 2008)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.400)	1310
Females (2009 - 2010)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.200)	.300 (.200-.300)	1350
Mexican Americans (2003 - 2004)	*	< LOD	.100 (<LOD-.200)	.200 (.200-.300)	.300 (.200-.400)	617
Mexican Americans (2005 - 2006)	*	< LOD	.100 (<LOD-.200)	.300 (.200-.300)	.400 (.300-.500)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.300)	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.300)	566
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.200 (.100-.200)	.300 (.200-.500)	.400 (.300-.700)	636
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.200 (.100-.200)	.300 (.200-.400)	.500 (.300-.500)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.100 (.100-.200)	.200 (.200-.300)	.400 (.300-.500)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.200)	.200 (.200-.300)	516
Non-Hispanic whites (2003 - 2004)	*	< LOD	.100 (.100-.100)	.200 (.200-.300)	.400 (.300-.400)	1077
Non-Hispanic whites (2005 - 2006)	*	< LOD	.100 (.100-.200)	.300 (.200-.300)	.400 (.300-.600)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.400)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.200 (.200-.200)	.300 (.200-.300)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.1, 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Trichlorophenols_BiomonitoringSummary.html

Urinary 2,4,5-Trichlorophenol (creatinine corrected) (2003 – 2010)‡

CAS Number 95-95-4

Metabolite of Several Organochlorine Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	.170 (.160-.180)	.280 (.260-.310)	.370 (.330-.420)	2522
Total population (2005 - 2006)	*	< LOD	.160 (.150-.180)	.290 (.260-.320)	.410 (.360-.450)	2548
Total population (2007 - 2008)	*	< LOD	.150 (<LOD-.160)	.280 (.230-.320)	.390 (.330-.470)	2604
Total population (2009 - 2010)	*	< LOD	< LOD	.260 (.240-.280)	.350 (.320-.390)	2749
Age 6-11 years (2003 - 2004)	*	< LOD	.180 (.150-.230)	.290 (.250-.320)	.370 (.310-.540)	314
Age 6-11 years (2005 - 2006)	*	< LOD	.180 (.140-.200)	.310 (.210-.450)	.450 (.320-.610)	356
Age 6-11 years (2007 - 2008)	*	< LOD	.180 (<LOD-.190)	.270 (.210-.390)	.430 (.270-.580)	389
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.320 (.240-.350)	.390 (.320-.470)	415
Age 12-19 years (2003 - 2004)	*	< LOD	.120 (.100-.140)	.200 (.170-.220)	.240 (.220-.280)	720
Age 12-19 years (2005 - 2006)	*	< LOD	.120 (.110-.130)	.210 (.180-.240)	.290 (.240-.330)	702
Age 12-19 years (2007 - 2008)	*	< LOD	.100 (<LOD-.120)	.170 (.150-.210)	.250 (.170-.310)	401
Age 12-19 years (2009 - 2010)	*	< LOD	.110 (<LOD-.130)	.190 (.150-.250)	.280 (.190-.380)	420
Age 20+ years (2003 - 2004)	*	< LOD	.180 (.160-.180)	.290 (.270-.320)	.390 (.350-.470)	1488
Age 20+ years (2005 - 2006)	*	< LOD	.170 (.150-.190)	.300 (.260-.330)	.410 (.370-.470)	1490
Age 20+ years (2007 - 2008)	*	< LOD	.150 (<LOD-.180)	.290 (.230-.350)	.410 (.340-.500)	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	.270 (.240-.280)	.350 (.320-.410)	1914
Males (2003 - 2004)	*	< LOD	.130 (.110-.150)	.230 (.190-.260)	.320 (.270-.350)	1230
Males (2005 - 2006)	*	< LOD	.130 (.120-.140)	.220 (.190-.240)	.310 (.260-.360)	1270
Males (2007 - 2008)	*	< LOD	.110 (<LOD-.120)	.190 (.180-.230)	.300 (.230-.340)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.210 (.190-.230)	.280 (.240-.330)	1399
Females (2003 - 2004)	*	< LOD	.200 (.180-.210)	.320 (.290-.350)	.440 (.350-.510)	1292
Females (2005 - 2006)	*	< LOD	.210 (.180-.230)	.350 (.300-.410)	.470 (.410-.550)	1278
Females (2007 - 2008)	*	< LOD	.190 (<LOD-.230)	.330 (.280-.410)	.470 (.370-.580)	1310
Females (2009 - 2010)	*	< LOD	.180 (<LOD-.190)	.300 (.280-.330)	.420 (.330-.470)	1350
Mexican Americans (2003 - 2004)	*	< LOD	.140 (<LOD-.150)	.240 (.200-.280)	.330 (.280-.460)	616
Mexican Americans (2005 - 2006)	*	< LOD	.140 (<LOD-.160)	.240 (.190-.320)	.350 (.290-.380)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.210 (.180-.250)	.270 (.240-.320)	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.190 (<LOD-.230)	.290 (.220-.330)	566
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.120 (.100-.150)	.230 (.170-.290)	.310 (.230-.390)	635
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.110 (.100-.140)	.210 (.170-.260)	.320 (.260-.360)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.120 (.100-.140)	.200 (.170-.250)	.290 (.230-.420)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.090 (<LOD-.110)	.160 (.130-.200)	.220 (.160-.380)	516
Non-Hispanic whites (2003 - 2004)	*	< LOD	.180 (.160-.190)	.290 (.260-.320)	.370 (.340-.440)	1076
Non-Hispanic whites (2005 - 2006)	*	< LOD	.180 (.160-.190)	.300 (.270-.350)	.410 (.360-.500)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	.160 (<LOD-.190)	.300 (.250-.360)	.440 (.330-.510)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.280 (.250-.320)	.370 (.330-.410)	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Trichlorophenols_BiomonitoringSummary.html

Urinary 2,4,6-Trichlorophenol (2003 – 2010)‡

CAS Number 88-06-2

Metabolite of Several Organochlorine Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	.500 (<LOD-.600)	1.00 (.800-1.20)	1.40 (1.20-1.80)	2525
Total population (2005 - 2006)	*	< LOD	.600 (<LOD-.700)	1.00 (.800-1.20)	1.40 (1.20-1.80)	2548
Total population (2007 - 2008)	*	< LOD	< LOD	.800 (.700-.900)	1.20 (1.00-1.30)	2604
Total population (2009 - 2010)	*	< LOD	.500 (<LOD-.600)	.800 (.700-.900)	1.10 (1.00-1.40)	2749
Age 6-11 years (2003 - 2004)	*	< LOD	.600 (.500-.700)	1.10 (.800-1.40)	1.90 (1.10-3.10)	314
Age 6-11 years (2005 - 2006)	*	< LOD	.700 (.600-.900)	1.30 (1.00-2.30)	2.70 (1.30-5.40)	356
Age 6-11 years (2007 - 2008)	*	< LOD	.600 (<LOD-.700)	1.10 (.900-1.40)	1.60 (1.30-2.10)	389
Age 6-11 years (2009 - 2010)	*	< LOD	.500 (<LOD-.600)	.900 (.700-1.20)	1.30 (.900-2.20)	415
Age 12-19 years (2003 - 2004)	*	< LOD	.600 (.500-.800)	1.20 (.900-1.70)	1.80 (1.50-2.10)	722
Age 12-19 years (2005 - 2006)	*	< LOD	.600 (<LOD-.800)	1.00 (.800-1.30)	1.30 (1.20-1.70)	702
Age 12-19 years (2007 - 2008)	*	< LOD	.600 (<LOD-.700)	.800 (.700-1.10)	1.10 (.800-1.70)	401
Age 12-19 years (2009 - 2010)	*	< LOD	.600 (<LOD-.700)	.900 (.700-1.30)	1.30 (.900-1.90)	420
Age 20+ years (2003 - 2004)	*	< LOD	.500 (<LOD-.600)	1.00 (.800-1.10)	1.30 (1.10-1.70)	1489
Age 20+ years (2005 - 2006)	*	< LOD	.600 (<LOD-.700)	1.00 (.800-1.20)	1.30 (1.20-1.80)	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	.800 (.700-.900)	1.10 (.900-1.30)	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	.800 (.700-.900)	1.10 (1.00-1.20)	1914
Males (2003 - 2004)	*	< LOD	.600 (<LOD-.600)	1.00 (.800-1.10)	1.30 (1.10-1.80)	1231
Males (2005 - 2006)	*	< LOD	.600 (<LOD-.800)	1.10 (.900-1.30)	1.60 (1.20-2.00)	1270
Males (2007 - 2008)	*	< LOD	.500 (<LOD-.600)	.900 (.700-1.00)	1.20 (1.10-1.40)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.800 (.700-.900)	1.10 (1.00-1.20)	1399
Females (2003 - 2004)	*	< LOD	.500 (<LOD-.600)	1.10 (.900-1.20)	1.40 (1.10-2.00)	1294
Females (2005 - 2006)	*	< LOD	.500 (<LOD-.600)	.900 (.800-1.20)	1.30 (1.10-1.70)	1278
Females (2007 - 2008)	*	< LOD	< LOD	.800 (.700-.900)	1.10 (.900-1.40)	1310
Females (2009 - 2010)	*	< LOD	.500 (<LOD-.600)	.800 (.700-1.00)	1.10 (.900-1.60)	1350
Mexican Americans (2003 - 2004)	*	< LOD	.700 (.600-.800)	1.20 (1.10-1.60)	1.80 (1.30-2.00)	617
Mexican Americans (2005 - 2006)	*	< LOD	.600 (.500-.700)	1.00 (.800-1.20)	1.30 (1.20-1.70)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.700 (.700-.900)	1.00 (.900-1.20)	531
Mexican Americans (2009 - 2010)	*	< LOD	.500 (<LOD-.600)	.900 (.700-1.10)	1.10 (.900-1.30)	566
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.900 (.700-1.00)	1.40 (1.10-1.90)	2.00 (1.50-2.70)	636
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.800 (.700-1.10)	1.50 (1.20-1.90)	2.20 (1.60-3.30)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.600 (.500-.600)	1.00 (.900-1.10)	1.30 (1.10-1.60)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.700 (.600-.800)	1.10 (.900-1.30)	1.50 (1.20-2.00)	516
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	.800 (.700-1.00)	1.20 (1.00-1.50)	1077
Non-Hispanic whites (2005 - 2006)	*	< LOD	.500 (<LOD-.700)	.900 (.700-1.30)	1.30 (1.10-1.80)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.800 (.700-.900)	1.20 (1.00-1.40)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.700 (.600-.900)	1.00 (.800-1.30)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.5, 0.5, 0.5, and 0.5 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Trichlorophenols_BiomonitoringSummary.html

Urinary 2,4,6-Trichlorophenol (creatinine corrected) (2003 – 2010)‡

CAS Number 88-06-2

Metabolite of Several Organochlorine Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	.710 (<LOD-.780)	1.25 (1.17-1.35)	1.75 (1.59-2.06)	2522
Total population (2005 - 2006)	*	< LOD	.720 (<LOD-.760)	1.27 (1.17-1.38)	1.75 (1.59-1.94)	2548
Total population (2007 - 2008)	*	< LOD	< LOD	1.25 (1.06-1.42)	1.75 (1.52-2.19)	2604
Total population (2009 - 2010)	*	< LOD	.710 (<LOD-.760)	1.21 (1.13-1.35)	1.67 (1.55-1.84)	2749
Age 6-11 years (2003 - 2004)	*	< LOD	.920 (.850-1.13)	1.59 (1.22-1.91)	2.11 (1.46-4.55)	314
Age 6-11 years (2005 - 2006)	*	< LOD	.880 (.740-1.06)	1.59 (1.21-2.06)	2.50 (1.61-5.20)	356
Age 6-11 years (2007 - 2008)	*	< LOD	.900 (<LOD-.930)	1.46 (1.14-1.67)	2.33 (1.52-2.92)	389
Age 6-11 years (2009 - 2010)	*	< LOD	.850 (<LOD-1.03)	1.59 (1.17-1.74)	1.85 (1.67-2.33)	415
Age 12-19 years (2003 - 2004)	*	< LOD	.580 (.510-.660)	.970 (.830-1.10)	1.21 (1.09-1.49)	720
Age 12-19 years (2005 - 2006)	*	< LOD	.550 (<LOD-.630)	.970 (.690-1.17)	1.40 (1.08-1.59)	702
Age 12-19 years (2007 - 2008)	*	< LOD	.550 (<LOD-.610)	.830 (.730-1.03)	1.30 (.930-1.48)	401
Age 12-19 years (2009 - 2010)	*	< LOD	.590 (<LOD-.700)	.970 (.690-1.23)	1.23 (.920-1.66)	420
Age 20+ years (2003 - 2004)	*	< LOD	.710 (<LOD-.770)	1.25 (1.17-1.35)	1.75 (1.59-2.00)	1488
Age 20+ years (2005 - 2006)	*	< LOD	.730 (<LOD-.780)	1.30 (1.17-1.40)	1.75 (1.57-2.06)	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	1.30 (1.06-1.46)	1.84 (1.52-2.33)	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	1.21 (1.13-1.35)	1.67 (1.52-1.94)	1914
Males (2003 - 2004)	*	< LOD	.560 (<LOD-.600)	.920 (.820-1.10)	1.30 (1.17-1.46)	1230
Males (2005 - 2006)	*	< LOD	.600 (<LOD-.650)	1.00 (.850-1.13)	1.43 (1.25-1.59)	1270
Males (2007 - 2008)	*	< LOD	.530 (<LOD-.600)	.930 (.830-1.06)	1.46 (1.18-1.59)	1294
Males (2009 - 2010)	*	< LOD	< LOD	.980 (.850-1.12)	1.33 (1.13-1.59)	1399
Females (2003 - 2004)	*	< LOD	.900 (<LOD-.960)	1.59 (1.35-1.75)	2.19 (1.75-2.63)	1292
Females (2005 - 2006)	*	< LOD	.850 (<LOD-.970)	1.46 (1.30-1.67)	2.06 (1.67-2.50)	1278
Females (2007 - 2008)	*	< LOD	< LOD	1.46 (1.23-1.75)	2.19 (1.67-2.50)	1310
Females (2009 - 2010)	*	< LOD	.850 (<LOD-.920)	1.46 (1.30-1.59)	2.06 (1.62-2.33)	1350
Mexican Americans (2003 - 2004)	*	< LOD	.760 (.600-.900)	1.15 (.970-1.38)	1.59 (1.18-2.42)	616
Mexican Americans (2005 - 2006)	*	< LOD	.650 (.570-.700)	1.03 (.860-1.19)	1.46 (1.11-1.94)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	1.05 (.910-1.17)	1.35 (1.13-1.57)	531
Mexican Americans (2009 - 2010)	*	< LOD	.690 (<LOD-.760)	1.00 (.900-1.33)	1.67 (1.13-2.18)	566
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.600 (.560-.640)	.950 (.800-1.10)	1.34 (1.06-1.67)	635
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.630 (.540-.740)	1.03 (.830-1.49)	1.59 (1.13-2.07)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.520 (.470-.620)	1.00 (.830-1.13)	1.40 (1.13-1.52)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.560 (.490-.610)	.830 (.750-.950)	1.17 (.920-1.52)	516
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	1.30 (1.17-1.46)	1.75 (1.59-2.11)	1076
Non-Hispanic whites (2005 - 2006)	*	< LOD	.760 (<LOD-.830)	1.35 (1.25-1.50)	1.79 (1.60-2.06)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	1.35 (1.13-1.52)	1.84 (1.52-2.50)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	1.30 (1.18-1.46)	1.73 (1.59-2.06)	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Trichlorophenols_BiomonitoringSummary.html

Urinary Acephate (2003 – 2008)

CAS Number 30560-19-1

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2491
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2546
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2505
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	309
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	343
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	374
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	715
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	696
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	375
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	939
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1050
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1134
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	528
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	457
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	622
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1221
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1205
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1250
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1270
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1341
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1255
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	608
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	666
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	476
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	647
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	698
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	551
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1077
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	979
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1062

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.1, 0.25, and 0.27 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acephate_BiomonitoringSummary.html

Urinary Acephate (creatinine corrected) (2003 – 2008)

CAS Number 30560-19-1

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2489
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2546
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2503
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	309
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	343
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	374
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	714
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	696
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	373
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	938
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1050
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1134
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	528
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	457
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	622
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1220
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1205
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1249
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1269
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1341
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1254
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	607
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	666
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	475
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	647
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	698
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	550
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1076
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	979
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1062

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acephate_BiomonitoringSummary.html

Urinary Dimethoate (2003 – 2008)

CAS Number 60-51-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2455
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2628
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2573
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	306
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	349
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	708
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	388
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	922
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1087
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1170
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	519
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	474
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	633
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1197
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1245
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1290
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1258
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1383
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1283
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	605
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	693
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	493
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	629
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	719
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	570
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1068
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.1, 0.25, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DimethoateOmethoate_BiomonitoringSummary.html

Urinary Dimethoate (creatinine corrected) (2003 – 2008)

CAS Number 60-51-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2453
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2628
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2571
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	306
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	349
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	707
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	386
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	921
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1087
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1170
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	519
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	474
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	633
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1196
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1245
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1257
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1383
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1282
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	604
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	693
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	492
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	629
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	719
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	569
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1067
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DimethoateOmethoate_BiomonitoringSummary.html

Urinary Methamidophos (2003 – 2008)

CAS Number 10265-92-6

Also a metabolite of Acephate

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2379
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2591
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2573
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	295
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	346
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	683
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	710
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	388
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	893
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1070
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1169
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	508
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	465
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	634
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1171
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1232
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1290
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1208
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1359
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1283
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	564
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	688
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	492
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	631
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	717
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	571
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1034
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	979
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.1, 0.37, and 0.41 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Methamidophos_BiomonitoringSummary.html

Urinary Methamidophos (creatinine corrected) (2003 – 2008)

CAS Number 10265-92-6

Also a metabolite of Acephate

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2377
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2591
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2571
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	295
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	346
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	682
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	710
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	386
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	892
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1070
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1169
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	508
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	465
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	634
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1170
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1232
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1207
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1359
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1282
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	563
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	688
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	491
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	631
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	717
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	570
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1033
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	979
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Methamidophos_BiomonitoringSummary.html

Urinary Omethoate (2003 – 2008)

CAS Number 1113-02-6

Metabolite of Dimethoate

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2455
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2628
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2574
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	303
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	349
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	707
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	388
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	923
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1086
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1170
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	522
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	475
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	634
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1207
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1245
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1290
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1248
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1383
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1284
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	606
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	693
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	493
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	637
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	719
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	571
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1055
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, and 07-08 are 0.1, 0.14, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DimethoateOmethoate_BiomonitoringSummary.html

Urinary Omethoate (creatinine corrected) (2003 – 2008)

CAS Number 1113-02-6

Metabolite of Dimethoate

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2453
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2628
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2572
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	303
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	349
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	382
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	706
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	386
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	922
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1086
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1170
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	522
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	475
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	634
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1206
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1245
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1247
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1383
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1283
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	605
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	693
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	492
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	637
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	719
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	570
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1054
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1084

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DimethoateOmethoate_BiomonitoringSummary.html

Urinary Malathion dicarboxylic acid (1999 – 2010)

CAS Number 1190-28-9

Metabolite of Malathion

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1920
Total population (2007 - 2008)	*	< LOD	< LOD	.980 (.900-1.08)	1.65 (1.44-1.94)	2581
Total population (2009 - 2010)	*	< LOD	< LOD	.990 (.830-1.09)	2.05 (1.64-2.33)	2742
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	2.80 (<LOD-5.50)	453
Age 6-11 years (2007 - 2008)	*	< LOD	.510 (<LOD-.640)	1.26 (.810-2.13)	2.32 (1.43-3.55)	383
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	1.10 (.580-1.59)	1.80 (1.15-3.73)	385
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	660
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	1.09 (.740-1.40)	1.59 (1.14-1.94)	390
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	1.08 (.520-1.41)	1.60 (1.00-3.37)	400
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	807
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	.900 (.770-1.01)	1.41 (1.14-1.65)	1177
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	.910 (.710-1.10)	2.23 (1.65-2.57)	1307
Age 60+ years (2007 - 2008)	*	< LOD	.500 (<LOD-.580)	1.37 (.980-1.73)	3.29 (1.48-7.45)	631
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	1.03 (.830-1.25)	1.63 (1.34-3.34)	650
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	937
Males (2007 - 2008)	*	< LOD	< LOD	1.05 (.930-1.23)	1.90 (1.55-2.46)	1290
Males (2009 - 2010)	*	< LOD	< LOD	.950 (.720-1.19)	1.85 (1.22-2.86)	1341
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	983
Females (2007 - 2008)	*	< LOD	< LOD	.860 (.660-1.13)	1.52 (1.13-1.91)	1291
Females (2009 - 2010)	*	< LOD	< LOD	1.00 (.720-1.29)	2.19 (1.64-2.63)	1401
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	680
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.740 (.550-1.01)	1.12 (.900-1.52)	500
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.790 (.540-1.05)	1.29 (.920-1.94)	600
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	498
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.670 (.540-.810)	1.06 (.860-1.34)	573
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.630 (<LOD-.880)	1.33 (.880-1.80)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	580
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	1.08 (.900-1.29)	1.84 (1.55-2.47)	1079
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	1.09 (.910-1.30)	2.33 (1.81-2.87)	1197

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 07-08, and 09-10 are 2.64, 0.5, and 0.5 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Malathion_BiomonitoringSummary.html

Urinary Malathion dicarboxylic acid (creatinine corrected) (1999 – 2010)

CAS Number 1190-28-9

Metabolite of Malathion

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1920
Total population (2007 - 2008)	*	< LOD	< LOD	1.46 (1.30-1.71)	2.19 (1.85-2.72)	2579
Total population (2009 - 2010)	*	< LOD	< LOD	1.52 (1.40-1.65)	2.50 (2.13-2.94)	2742
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	3.74 (<LOD-5.50)	453
Age 6-11 years (2007 - 2008)	*	< LOD	.946 (<LOD-1.14)	1.85 (1.55-2.27)	2.84 (1.85-5.11)	383
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	1.75 (1.25-2.19)	2.25 (1.94-6.25)	385
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	660
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.982 (.761-1.21)	1.46 (1.06-1.80)	388
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	.946 (.833-1.25)	1.49 (.946-3.41)	400
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	807
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	1.35 (1.21-1.52)	1.96 (1.71-2.69)	1177
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	1.53 (1.40-1.67)	2.56 (2.06-3.26)	1307
Age 60+ years (2007 - 2008)	*	< LOD	1.06 (<LOD-1.17)	2.06 (1.64-2.72)	3.58 (2.19-8.63)	631
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	1.62 (1.40-1.94)	2.52 (2.19-3.28)	650
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	937
Males (2007 - 2008)	*	< LOD	< LOD	1.13 (1.00-1.31)	1.73 (1.40-2.09)	1289
Males (2009 - 2010)	*	< LOD	< LOD	1.25 (1.06-1.52)	2.06 (1.59-2.52)	1341
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	983
Females (2007 - 2008)	*	< LOD	< LOD	1.82 (1.46-2.06)	2.72 (2.19-3.08)	1290
Females (2009 - 2010)	*	< LOD	< LOD	1.67 (1.46-2.06)	2.94 (2.33-3.97)	1401
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	680
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	1.13 (.946-1.46)	1.84 (1.21-2.69)	499
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	1.30 (1.13-1.56)	1.84 (1.52-2.10)	600
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	498
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.946 (.756-1.09)	1.35 (1.03-1.67)	572
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.875 (<LOD-1.06)	1.46 (1.09-1.75)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	580
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	1.63 (1.32-1.84)	2.47 (1.94-3.06)	1079
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	1.63 (1.46-1.89)	2.99 (2.33-3.69)	1197

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Malathion_BiomonitoringSummary.html

Urinary 2-Isopropyl-4-methyl-6-hydroxypyrimidine (IMPY) (1999 – 2010)

CAS Number 2814-20-2

Metabolite of Diazinon

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1842
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3044
Total population (2007 - 2008)	*	< LOD	< LOD	.350 (.260-.470)	.720 (.530-.890)	2588
Total population (2009 - 2010)	*	< LOD	< LOD	.180 (.100-.280)	.440 (.310-.660)	2747
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	454
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	1.45 (<LOD-3.11)	580
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.260 (.160-.510)	.580 (.380-1.29)	385
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.180 (<LOD-.260)	.410 (.210-.480)	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	632
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	829
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.320 (.180-.510)	.660 (.350-1.24)	390
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	.260 (<LOD-.390)	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	756
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1126
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	.310 (.220-.500)	.670 (.490-.890)	1180
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	.160 (<LOD-.280)	.450 (.280-.810)	1309
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	509
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	.470 (.320-.670)	1.02 (.600-1.27)	633
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	.290 (.200-.430)	.640 (.350-.860)	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	894
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1427
Males (2007 - 2008)	*	< LOD	< LOD	.390 (.300-.500)	.760 (.530-1.02)	1293
Males (2009 - 2010)	*	< LOD	< LOD	.160 (<LOD-.240)	.450 (.270-.710)	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	948
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1617
Females (2007 - 2008)	*	< LOD	< LOD	.300 (.210-.450)	.670 (.510-.830)	1295
Females (2009 - 2010)	*	< LOD	< LOD	.210 (.130-.290)	.440 (.310-.600)	1404
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	644
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	765
Mexican Americans (2007 - 2008)	*	< LOD	.110 (<LOD-.160)	.350 (.260-.440)	.540 (.400-.790)	500
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.140 (<LOD-.210)	.360 (.210-.570)	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	484
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	1.49 (<LOD-2.36)	775
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.230 (.140-.300)	.680 (.460-.990)	1.26 (.880-1.77)	574
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.430 (.310-.510)	.760 (.460-1.21)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	554
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1280
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.270 (.190-.400)	.650 (.440-.880)	1084
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.120 (<LOD-.260)	.410 (.280-.660)	1200

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 07-08, and 09-10 are 7.2, 0.7, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Diazinon_BiomonitoringSummary.html

Urinary 2-Isopropyl-4-methyl-6-hydroxypyrimidine (IMPY) (creatinine corrected) (1999 – 2010)

CAS Number 2814-20-2

Metabolite of Diazinon

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1842
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3042
Total population (2007 - 2008)	*	< LOD	< LOD	.412 (.333-.508)	.731 (.538-1.00)	2586
Total population (2009 - 2010)	*	< LOD	< LOD	.313 (.269-.350)	.526 (.429-.636)	2747
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	454
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	2.72 (<LOD-4.46)	580
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.412 (.304-.658)	1.00 (.412-1.59)	385
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.333 (<LOD-.438)	.438 (.323-.900)	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	632
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	828
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.278 (.175-.452)	.460 (.276-1.17)	388
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	.228 (<LOD-.365)	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	756
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1126
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	.383 (.304-.508)	.645 (.500-.846)	1180
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	.304 (<LOD-.350)	.526 (.364-.700)	1309
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	508
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	.594 (.414-.822)	1.05 (.708-1.80)	633
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	.438 (.333-.551)	.773 (.550-1.09)	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	894
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1427
Males (2007 - 2008)	*	< LOD	< LOD	.333 (.286-.457)	.677 (.500-.795)	1292
Males (2009 - 2010)	*	< LOD	< LOD	.259 (<LOD-.318)	.438 (.318-.613)	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	948
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1615
Females (2007 - 2008)	*	< LOD	< LOD	.438 (.368-.632)	.822 (.562-1.35)	1294
Females (2009 - 2010)	*	< LOD	< LOD	.347 (.304-.407)	.583 (.500-.710)	1404
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	644
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	765
Mexican Americans (2007 - 2008)	*	< LOD	.172 (<LOD-.203)	.385 (.260-.483)	.636 (.401-.990)	499
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.271 (<LOD-.333)	.412 (.350-.538)	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	484
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	1.89 (<LOD-3.06)	774
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.202 (.152-.256)	.571 (.333-.800)	1.01 (.728-1.47)	573
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.318 (.269-.374)	.619 (.352-.933)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	554
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1279
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.368 (.292-.484)	.700 (.418-1.06)	1084
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.304 (<LOD-.368)	.525 (.412-.691)	1200

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Diazinon_BiomonitoringSummary.html

Urinary para-Nitrophenol (1999 – 2010)

CAS Number 100-02-7

Metabolite of Ethyl Parathion, Methyl Parathion, and Nitrobenzene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	2.50 (1.40-4.50)	5.00 (2.90-11.0)	1989
Total population (2001 - 2002)	*	< LOD	1.33 (1.20-1.46)	2.69 (2.39-3.01)	3.72 (3.46-4.15)	2975
Total population (2007 - 2008)	.673 (.595-.761)	.740 (.660-.830)	1.49 (1.32-1.66)	2.77 (2.19-3.45)	4.50 (3.50-5.42)	2564
Total population (2009 - 2010)	.454 (.407-.506)	.510 (.440-.580)	1.09 (1.00-1.19)	2.18 (1.99-2.34)	3.14 (2.85-3.55)	2744
Age 6-11 years (1999 - 2000)	*	< LOD	.940 (<LOD-2.40)	2.67 (1.70-3.80)	4.30 (2.70-6.40)	479
Age 6-11 years (2001 - 2002)	*	.790 (<LOD-.910)	1.49 (1.36-1.61)	2.89 (2.22-3.58)	4.10 (3.01-4.74)	565
Age 6-11 years (2007 - 2008)	.803 (.678-.952)	.890 (.760-1.01)	1.66 (1.26-1.99)	2.85 (2.10-3.94)	4.37 (2.91-6.75)	383
Age 6-11 years (2009 - 2010)	.506 (.426-.601)	.600 (.500-.720)	1.20 (.980-1.43)	2.21 (1.74-2.73)	2.85 (2.28-3.81)	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	3.40 (1.60-5.70)	5.70 (2.60-19.0)	680
Age 12-19 years (2001 - 2002)	*	.730 (<LOD-.910)	1.45 (1.32-1.61)	2.66 (2.15-3.11)	3.34 (3.11-4.01)	813
Age 12-19 years (2007 - 2008)	.769 (.614-.962)	.850 (.680-1.02)	1.49 (1.28-1.74)	2.79 (1.94-3.45)	3.47 (2.97-4.48)	387
Age 12-19 years (2009 - 2010)	.430 (.375-.493)	.520 (.460-.590)	.950 (.870-1.09)	1.84 (1.43-2.03)	2.37 (1.84-2.98)	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	2.30 (1.20-5.70)	4.50 (2.30-16.0)	830
Age 20-59 years (2001 - 2002)	*	< LOD	1.28 (1.09-1.47)	2.69 (2.32-3.10)	3.72 (3.37-4.24)	1099
Age 20-59 years (2007 - 2008)	.658 (.574-.754)	.720 (.640-.840)	1.49 (1.31-1.65)	2.77 (2.10-3.70)	4.68 (3.37-5.56)	1173
Age 20-59 years (2009 - 2010)	.452 (.400-.511)	.510 (.420-.590)	1.12 (1.00-1.24)	2.16 (1.91-2.39)	3.27 (2.84-3.58)	1308
Age 60+ years (2001 - 2002)	*	< LOD	1.29 (1.07-1.49)	2.66 (2.11-3.39)	4.01 (3.17-7.19)	498
Age 60+ years (2007 - 2008)	.607 (.512-.720)	.610 (.550-.710)	1.41 (1.14-1.76)	2.81 (2.19-3.90)	4.70 (2.90-6.91)	621
Age 60+ years (2009 - 2010)	.453 (.386-.530)	.460 (.380-.580)	1.06 (.970-1.33)	2.42 (1.87-3.00)	3.65 (3.00-4.36)	649
Males (1999 - 2000)	*	< LOD	< LOD	2.50 (1.40-4.50)	4.50 (2.50-14.0)	971
Males (2001 - 2002)	*	.760 (.450-.880)	1.49 (1.32-1.63)	3.01 (2.66-3.33)	4.13 (3.61-4.92)	1395
Males (2007 - 2008)	.782 (.690-.887)	.850 (.740-.980)	1.59 (1.43-1.73)	2.85 (2.19-3.53)	4.52 (3.47-5.01)	1282
Males (2009 - 2010)	.524 (.472-.581)	.590 (.490-.670)	1.30 (1.14-1.42)	2.29 (2.07-2.54)	3.29 (2.90-3.73)	1342
Females (1999 - 2000)	*	< LOD	< LOD	2.50 (1.30-5.70)	5.70 (2.90-9.50)	1018
Females (2001 - 2002)	*	< LOD	1.18 (1.01-1.37)	2.29 (1.95-2.69)	3.52 (3.16-3.77)	1580
Females (2007 - 2008)	.582 (.510-.664)	.640 (.550-.720)	1.32 (1.10-1.59)	2.72 (2.16-3.35)	4.37 (3.09-5.64)	1282
Females (2009 - 2010)	.396 (.352-.446)	.440 (.380-.510)	.960 (.860-1.06)	2.01 (1.70-2.26)	3.07 (2.62-3.55)	1402
Mexican Americans (1999 - 2000)	*	< LOD	1.70 (<LOD-3.50)	5.80 (2.60-24.0)	22.0 (3.60-36.0)	695
Mexican Americans (2001 - 2002)	*	.680 (<LOD-.840)	1.33 (1.08-1.58)	2.61 (1.91-3.41)	3.64 (2.70-5.73)	744
Mexican Americans (2007 - 2008)	.624 (.542-.720)	.700 (.560-.810)	1.37 (1.16-1.52)	2.58 (2.03-3.33)	4.46 (2.79-6.91)	494
Mexican Americans (2009 - 2010)	.484 (.392-.599)	.560 (.440-.710)	1.30 (1.03-1.46)	2.21 (1.78-2.46)	3.07 (2.39-3.73)	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	1.20 (<LOD-2.60)	2.90 (1.70-6.00)	4.80 (2.50-9.20)	518
Non-Hispanic blacks (2001 - 2002)	*	.850 (<LOD-1.10)	1.76 (1.36-2.15)	3.13 (2.47-4.26)	4.92 (3.75-6.36)	752
Non-Hispanic blacks (2007 - 2008)	.826 (.716-.952)	.860 (.760-1.01)	1.71 (1.45-1.92)	3.15 (2.56-3.90)	4.72 (3.91-5.68)	568
Non-Hispanic blacks (2009 - 2010)	.505 (.381-.670)	.570 (.400-.820)	1.30 (1.01-1.50)	2.19 (1.80-2.63)	3.49 (2.57-4.28)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	2.10 (<LOD-6.33)	4.20 (2.10-11.0)	603
Non-Hispanic whites (2001 - 2002)	*	< LOD	1.29 (1.14-1.42)	2.70 (2.38-3.10)	3.71 (3.38-4.00)	1259
Non-Hispanic whites (2007 - 2008)	.623 (.531-.730)	.690 (.610-.790)	1.36 (1.19-1.59)	2.51 (1.89-3.08)	3.63 (2.82-5.48)	1075
Non-Hispanic whites (2009 - 2010)	.440 (.388-.499)	.490 (.410-.580)	1.03 (.930-1.12)	2.18 (1.89-2.48)	3.14 (2.67-3.62)	1197

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 07-08, and 09-10 are 0.8, 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Nitrobenzene_BiomonitoringSummary.html

Urinary para-Nitrophenol (creatinine corrected) (1999 – 2010)

CAS Number 100-02-7

Metabolite of Ethyl Parathion, Methyl Parathion, and Nitrobenzene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	2.08 (1.33-3.91)	4.25 (2.15-10.2)	1989
Total population (2001 - 2002)	*	< LOD	.987 (.868-1.10)	1.97 (1.86-2.13)	2.98 (2.60-3.33)	2973
Total population (2007 - 2008)	.692 (.632-.757)	.673 (.624-.737)	1.28 (1.15-1.40)	2.38 (2.11-2.66)	3.57 (2.94-4.39)	2562
Total population (2009 - 2010)	.473 (.430-.521)	.490 (.438-.531)	.923 (.851-1.01)	1.87 (1.60-2.06)	2.62 (2.32-2.91)	2744
Age 6-11 years (1999 - 2000)	*	< LOD	.938 (<LOD-1.95)	2.80 (1.94-4.00)	4.20 (3.33-6.70)	479
Age 6-11 years (2001 - 2002)	*	.715 (<LOD-.870)	1.60 (1.30-1.82)	2.78 (2.31-3.11)	3.67 (3.11-4.61)	565
Age 6-11 years (2007 - 2008)	1.02 (.892-1.17)	1.02 (.920-1.12)	1.67 (1.46-1.90)	3.13 (2.51-3.64)	3.76 (3.31-4.89)	383
Age 6-11 years (2009 - 2010)	.684 (.598-.784)	.717 (.650-.826)	1.30 (1.10-1.54)	2.19 (2.00-2.59)	3.16 (2.33-3.67)	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	1.80 (1.08-3.04)	4.00 (1.57-7.29)	680
Age 12-19 years (2001 - 2002)	*	.373 (<LOD-.503)	.840 (.790-.951)	1.59 (1.37-1.78)	2.10 (1.78-2.43)	812
Age 12-19 years (2007 - 2008)	.597 (.511-.698)	.581 (.497-.697)	1.02 (.891-1.14)	1.64 (1.29-2.17)	2.92 (1.55-4.54)	385
Age 12-19 years (2009 - 2010)	.368 (.319-.426)	.413 (.350-.488)	.684 (.615-.732)	1.09 (.930-1.48)	1.73 (1.47-2.09)	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	2.00 (1.17-4.25)	4.29 (2.13-12.3)	830
Age 20-59 years (2001 - 2002)	*	< LOD	.875 (.693-1.07)	1.79 (1.56-2.05)	2.89 (2.35-3.33)	1099
Age 20-59 years (2007 - 2008)	.656 (.595-.724)	.635 (.585-.706)	1.22 (1.09-1.34)	2.19 (1.94-2.51)	3.04 (2.56-4.07)	1173
Age 20-59 years (2009 - 2010)	.452 (.410-.498)	.453 (.405-.521)	.868 (.805-.981)	1.61 (1.48-1.87)	2.34 (2.08-2.67)	1308
Age 60+ years (2001 - 2002)	*	< LOD	1.21 (.920-1.56)	2.29 (1.99-2.83)	4.29 (2.51-5.67)	497
Age 60+ years (2007 - 2008)	.755 (.643-.886)	.763 (.638-.909)	1.59 (1.40-1.73)	3.26 (2.46-4.47)	5.43 (3.33-7.09)	621
Age 60+ years (2009 - 2010)	.537 (.450-.641)	.520 (.451-.636)	1.15 (.899-1.59)	2.53 (2.03-3.39)	4.27 (2.98-5.26)	649
Males (1999 - 2000)	*	< LOD	< LOD	1.90 (1.01-3.39)	3.39 (1.77-7.55)	971
Males (2001 - 2002)	*	.433 (.333-.534)	.984 (.869-1.07)	1.89 (1.66-2.09)	2.98 (2.29-3.57)	1395
Males (2007 - 2008)	.650 (.595-.712)	.641 (.594-.697)	1.20 (1.08-1.33)	2.11 (1.63-2.49)	3.02 (2.51-3.71)	1281
Males (2009 - 2010)	.466 (.424-.512)	.495 (.432-.538)	.922 (.843-.985)	1.84 (1.48-2.05)	2.36 (2.21-2.68)	1342
Females (1999 - 2000)	*	< LOD	< LOD	2.26 (1.48-4.88)	6.92 (2.76-14.1)	1018
Females (2001 - 2002)	*	< LOD	.995 (.801-1.23)	2.08 (1.85-2.32)	3.04 (2.58-3.44)	1578
Females (2007 - 2008)	.735 (.660-.818)	.707 (.644-.779)	1.37 (1.21-1.63)	2.67 (2.20-3.25)	4.11 (3.11-5.06)	1281
Females (2009 - 2010)	.480 (.430-.536)	.488 (.426-.538)	.923 (.824-1.08)	1.93 (1.62-2.17)	2.72 (2.32-3.46)	1402
Mexican Americans (1999 - 2000)	*	< LOD	1.55 (<LOD-3.17)	4.86 (2.21-21.9)	17.4 (3.94-47.7)	695
Mexican Americans (2001 - 2002)	*	.389 (<LOD-.546)	.935 (.716-1.22)	1.89 (1.43-2.63)	3.23 (2.49-3.84)	744
Mexican Americans (2007 - 2008)	.638 (.538-.757)	.604 (.554-.708)	1.14 (.938-1.40)	2.03 (1.45-3.57)	3.63 (2.05-4.71)	493
Mexican Americans (2009 - 2010)	.506 (.419-.612)	.541 (.480-.621)	1.02 (.854-1.19)	1.73 (1.39-2.15)	2.35 (1.84-3.02)	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	.683 (<LOD-1.79)	2.07 (1.33-3.71)	3.71 (1.98-7.20)	518
Non-Hispanic blacks (2001 - 2002)	*	.438 (<LOD-.640)	1.04 (.847-1.27)	1.84 (1.59-2.30)	2.81 (2.14-4.30)	751
Non-Hispanic blacks (2007 - 2008)	.633 (.565-.708)	.634 (.553-.743)	1.07 (.973-1.23)	2.04 (1.64-2.32)	2.66 (2.11-3.54)	567
Non-Hispanic blacks (2009 - 2010)	.382 (.289-.505)	.431 (.312-.554)	.785 (.671-.874)	1.36 (1.03-1.99)	2.52 (1.73-3.22)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	1.97 (<LOD-4.29)	3.83 (1.97-10.2)	603
Non-Hispanic whites (2001 - 2002)	*	< LOD	.984 (.827-1.16)	2.06 (1.89-2.29)	3.11 (2.49-3.57)	1258
Non-Hispanic whites (2007 - 2008)	.677 (.604-.759)	.664 (.604-.761)	1.25 (1.10-1.38)	2.28 (2.00-2.56)	3.23 (2.60-4.00)	1075
Non-Hispanic whites (2009 - 2010)	.479 (.433-.530)	.490 (.433-.538)	.923 (.849-1.03)	1.92 (1.60-2.13)	2.62 (2.24-3.04)	1197

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Nitrobenzene_BiomonitoringSummary.html

Urinary 3,5,6-Trichloro-2-pyridinol (1999 – 2010)

CAS Number 6515-38-4

Metabolite of Chlorpyrifos and Chlorpyrifos-methyl

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	1.77 (1.46-2.14)	1.70 (1.40-2.20)	3.50 (2.50-5.20)	7.30 (4.80-10.0)	10.0 (7.70-15.0)	1994
Total population (2001 - 2002)	1.72 (1.50-1.97)	2.17 (1.81-2.51)	4.87 (4.45-5.24)	8.80 (7.80-9.77)	12.4 (10.7-15.2)	3011
Total population (2007 - 2008)	1.29 (1.20-1.39)	1.48 (1.31-1.65)	2.63 (2.39-2.94)	4.55 (4.03-5.14)	6.11 (5.60-6.93)	2588
Total population (2009 - 2010)	.779 (.706-.859)	1.03 (.920-1.16)	1.96 (1.80-2.20)	3.34 (2.96-3.68)	4.47 (4.04-5.15)	2747
Age 6-11 years (1999 - 2000)	2.88 (1.99-4.16)	2.80 (1.60-4.90)	7.09 (3.40-10.0)	12.0 (7.70-17.0)	16.0 (10.0-28.0)	481
Age 6-11 years (2001 - 2002)	2.67 (2.13-3.35)	3.09 (2.50-4.22)	6.36 (4.97-7.97)	10.9 (7.98-15.3)	15.3 (11.5-24.0)	573
Age 6-11 years (2007 - 2008)	1.72 (1.48-2.01)	1.85 (1.49-2.22)	3.18 (2.58-3.68)	4.69 (3.90-5.74)	6.04 (5.12-7.63)	385
Age 6-11 years (2009 - 2010)	1.12 (.899-1.39)	1.46 (1.27-1.64)	2.38 (1.96-2.75)	4.29 (2.67-6.07)	5.81 (4.14-7.16)	386
Age 12-19 years (1999 - 2000)	2.37 (1.89-2.97)	2.10 (1.60-3.00)	4.50 (2.90-7.10)	8.10 (5.50-14.0)	12.5 (8.00-24.0)	681
Age 12-19 years (2001 - 2002)	2.71 (2.19-3.35)	3.57 (2.66-4.34)	6.60 (5.61-7.59)	11.3 (8.66-15.1)	18.0 (13.7-23.7)	823
Age 12-19 years (2007 - 2008)	1.54 (1.27-1.86)	1.81 (1.39-2.20)	2.75 (2.34-3.29)	4.70 (3.66-5.72)	6.33 (4.98-7.96)	390
Age 12-19 years (2009 - 2010)	.884 (.793-.985)	1.08 (.960-1.30)	1.89 (1.64-2.28)	3.04 (2.28-4.21)	4.30 (3.14-5.60)	401
Age 20-59 years (1999 - 2000)	1.53 (1.29-1.83)	1.50 (1.30-1.80)	2.90 (2.20-4.30)	5.90 (3.90-8.90)	8.90 (6.70-11.0)	832
Age 20-59 years (2001 - 2002)	1.51 (1.32-1.72)	1.91 (1.44-2.26)	4.44 (3.90-4.80)	7.78 (7.00-8.91)	10.9 (9.52-12.4)	1113
Age 20-59 years (2007 - 2008)	1.19 (1.07-1.33)	1.36 (1.22-1.53)	2.55 (2.21-2.98)	4.46 (3.82-5.30)	5.85 (5.40-6.93)	1180
Age 20-59 years (2009 - 2010)	.710 (.634-.795)	.970 (.860-1.12)	1.89 (1.70-2.07)	3.14 (2.81-3.49)	4.18 (3.66-4.73)	1309
Age 60+ years (2001 - 2002)	1.51 (1.21-1.89)	1.76 (1.22-2.33)	4.36 (3.54-5.08)	9.11 (6.67-13.0)	13.5 (11.2-15.5)	502
Age 60+ years (2007 - 2008)	1.31 (1.17-1.47)	1.51 (1.27-1.70)	2.51 (2.34-2.78)	4.64 (3.97-5.81)	6.69 (5.14-8.14)	633
Age 60+ years (2009 - 2010)	.812 (.710-.929)	.990 (.870-1.15)	2.30 (1.73-2.58)	3.90 (3.16-4.67)	5.32 (4.23-6.85)	651
Males (1999 - 2000)	1.92 (1.60-2.32)	1.90 (1.50-2.40)	3.60 (2.70-5.60)	7.40 (5.04-10.0)	10.0 (7.70-16.0)	972
Males (2001 - 2002)	2.13 (1.82-2.49)	2.67 (2.24-3.16)	5.33 (4.81-6.05)	9.69 (8.45-11.5)	15.0 (11.7-17.7)	1416
Males (2007 - 2008)	1.49 (1.36-1.64)	1.70 (1.49-1.92)	2.85 (2.50-3.17)	4.87 (4.17-5.52)	6.01 (5.56-6.67)	1293
Males (2009 - 2010)	.865 (.775-.965)	1.16 (1.03-1.27)	2.10 (1.87-2.35)	3.50 (2.97-3.93)	4.66 (3.96-5.84)	1343
Females (1999 - 2000)	1.63 (1.31-2.02)	1.50 (1.20-2.00)	3.30 (2.30-5.30)	7.20 (4.30-12.0)	11.0 (7.20-16.0)	1022
Females (2001 - 2002)	1.40 (1.21-1.62)	1.63 (1.32-2.01)	4.31 (3.57-4.84)	7.78 (6.52-9.20)	10.9 (8.62-13.2)	1595
Females (2007 - 2008)	1.13 (1.04-1.22)	1.26 (1.13-1.40)	2.41 (2.15-2.79)	4.32 (3.76-4.98)	6.30 (5.27-7.59)	1295
Females (2009 - 2010)	.704 (.631-.786)	.940 (.830-1.04)	1.88 (1.63-2.11)	3.22 (2.78-3.72)	4.40 (4.09-4.73)	1404
Mexican Americans (1999 - 2000)	1.61 (1.31-2.00)	1.67 (1.30-2.20)	3.20 (2.60-3.80)	5.10 (3.80-8.40)	7.40 (5.10-17.0)	697
Mexican Americans (2001 - 2002)	1.98 (1.77-2.21)	2.54 (2.21-2.89)	4.55 (4.09-5.22)	8.94 (7.06-10.4)	11.9 (10.0-15.7)	744
Mexican Americans (2007 - 2008)	1.13 (.926-1.38)	1.26 (1.06-1.53)	2.34 (1.89-2.94)	4.04 (3.13-4.92)	5.36 (4.37-7.16)	500
Mexican Americans (2009 - 2010)	.761 (.650-.892)	.950 (.850-1.18)	1.90 (1.66-2.11)	3.31 (2.76-4.19)	4.64 (4.19-5.46)	602
Non-Hispanic blacks (1999 - 2000)	2.17 (1.59-2.97)	1.90 (1.43-2.80)	4.30 (2.50-8.30)	9.40 (6.40-13.7)	13.0 (9.40-26.0)	521
Non-Hispanic blacks (2001 - 2002)	2.14 (1.61-2.84)	2.85 (2.16-3.38)	5.45 (4.57-6.96)	9.27 (7.21-11.7)	12.9 (9.57-17.5)	776
Non-Hispanic blacks (2007 - 2008)	1.64 (1.36-1.97)	1.86 (1.47-2.24)	3.22 (2.65-4.17)	5.79 (4.85-7.17)	7.97 (6.49-9.58)	574
Non-Hispanic blacks (2009 - 2010)	.918 (.823-1.02)	1.22 (1.06-1.38)	2.24 (2.00-2.52)	3.49 (2.99-4.14)	4.99 (3.93-6.17)	504
Non-Hispanic whites (1999 - 2000)	1.76 (1.51-2.05)	1.70 (1.50-2.10)	3.50 (2.50-4.86)	7.10 (4.30-11.0)	10.0 (7.20-14.0)	602
Non-Hispanic whites (2001 - 2002)	1.67 (1.44-1.94)	2.11 (1.64-2.47)	4.85 (4.38-5.29)	8.91 (7.63-9.97)	12.9 (10.4-15.7)	1267
Non-Hispanic whites (2007 - 2008)	1.23 (1.16-1.30)	1.44 (1.27-1.58)	2.57 (2.35-2.83)	4.41 (3.89-4.87)	5.69 (5.40-6.14)	1084
Non-Hispanic whites (2009 - 2010)	.768 (.667-.885)	1.03 (.890-1.18)	1.96 (1.71-2.31)	3.42 (2.93-3.86)	4.46 (3.93-5.32)	1200

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 07-08, and 09-10 are 0.4, 0.4, 0.1, and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorpyrifos_BiomonitoringSummary.html

Urinary 3,5,6-Trichloro-2-pyridinol (creatinine corrected) (1999 – 2010)

CAS Number 6515-38-4

Metabolite of Chlorpyrifos and Chlorpyrifos-methyl

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	1.58 (1.35-1.85)	1.47 (1.24-1.74)	2.85 (2.12-3.59)	5.43 (4.22-6.68)	8.42 (6.25-11.6)	1994
Total population (2001 - 2002)	1.75 (1.53-2.00)	1.94 (1.66-2.25)	3.80 (3.13-4.48)	6.53 (5.24-8.23)	9.27 (7.46-12.1)	3009
Total population (2007 - 2008)	1.33 (1.22-1.44)	1.34 (1.25-1.48)	2.29 (2.06-2.48)	3.80 (3.44-4.15)	4.91 (4.47-5.83)	2586
Total population (2009 - 2010)	.812 (.748-.881)	.979 (.917-1.05)	1.66 (1.52-1.80)	2.67 (2.40-2.94)	3.53 (3.15-4.02)	2747
Age 6-11 years (1999 - 2000)	3.11 (2.31-4.19)	3.20 (2.05-4.80)	6.39 (4.14-8.19)	10.1 (7.26-14.0)	14.1 (10.1-21.0)	481
Age 6-11 years (2001 - 2002)	3.48 (2.80-4.32)	3.76 (3.17-4.36)	6.22 (4.88-8.57)	12.2 (7.24-24.4)	16.9 (12.1-38.0)	573
Age 6-11 years (2007 - 2008)	2.18 (1.89-2.53)	2.21 (1.86-2.66)	3.23 (2.86-3.89)	4.67 (4.23-5.00)	5.94 (4.76-6.58)	385
Age 6-11 years (2009 - 2010)	1.51 (1.28-1.78)	1.77 (1.49-1.95)	2.62 (2.26-2.90)	3.67 (2.93-4.42)	4.42 (3.76-5.95)	386
Age 12-19 years (1999 - 2000)	1.60 (1.34-1.91)	1.45 (1.21-1.81)	2.58 (1.98-3.92)	4.83 (3.44-6.16)	6.16 (4.43-10.6)	681
Age 12-19 years (2001 - 2002)	2.09 (1.72-2.55)	2.24 (1.92-2.66)	3.97 (3.30-4.72)	6.33 (5.62-7.89)	10.3 (7.65-15.2)	822
Age 12-19 years (2007 - 2008)	1.19 (1.05-1.34)	1.20 (1.05-1.33)	1.85 (1.61-2.22)	2.66 (2.32-3.62)	4.00 (2.70-5.77)	388
Age 12-19 years (2009 - 2010)	.757 (.675-.850)	.861 (.766-.935)	1.34 (1.15-1.55)	2.27 (1.55-2.68)	2.67 (2.13-4.21)	401
Age 20-59 years (1999 - 2000)	1.41 (1.23-1.62)	1.33 (1.12-1.58)	2.37 (1.87-3.01)	4.29 (3.53-5.56)	6.42 (5.11-9.02)	832
Age 20-59 years (2001 - 2002)	1.49 (1.30-1.71)	1.64 (1.39-1.88)	3.11 (2.60-3.91)	5.51 (4.33-7.23)	7.44 (5.80-11.0)	1113
Age 20-59 years (2007 - 2008)	1.19 (1.09-1.30)	1.22 (1.10-1.33)	2.04 (1.78-2.32)	3.42 (2.93-3.96)	4.84 (3.96-6.31)	1180
Age 20-59 years (2009 - 2010)	.710 (.644-.784)	.875 (.813-.943)	1.47 (1.35-1.62)	2.27 (1.99-2.66)	3.20 (2.75-3.64)	1309
Age 60+ years (2001 - 2002)	1.84 (1.55-2.18)	2.15 (1.71-2.60)	4.08 (3.61-4.84)	7.43 (6.50-8.50)	11.2 (7.95-13.5)	501
Age 60+ years (2007 - 2008)	1.61 (1.43-1.81)	1.68 (1.48-1.92)	2.88 (2.38-3.46)	4.46 (3.87-4.91)	5.59 (4.64-7.03)	633
Age 60+ years (2009 - 2010)	.963 (.838-1.11)	1.18 (1.01-1.34)	2.03 (1.87-2.19)	3.14 (2.73-4.02)	4.36 (3.47-5.36)	651
Males (1999 - 2000)	1.48 (1.27-1.72)	1.44 (1.19-1.68)	2.54 (2.05-3.38)	4.95 (3.84-6.54)	7.63 (5.65-11.0)	972
Males (2001 - 2002)	1.75 (1.51-2.02)	1.93 (1.66-2.24)	3.61 (3.01-4.22)	6.33 (5.08-8.88)	11.3 (7.54-13.5)	1416
Males (2007 - 2008)	1.24 (1.13-1.35)	1.29 (1.15-1.46)	2.12 (1.87-2.34)	3.44 (3.03-3.78)	4.41 (3.82-4.97)	1292
Males (2009 - 2010)	.769 (.712-.831)	.930 (.863-.988)	1.55 (1.39-1.70)	2.54 (2.18-2.80)	3.41 (3.01-3.93)	1343
Females (1999 - 2000)	1.69 (1.42-2.01)	1.51 (1.25-1.85)	2.97 (2.25-4.02)	5.63 (4.27-7.39)	8.44 (5.79-13.3)	1022
Females (2001 - 2002)	1.75 (1.52-2.02)	1.96 (1.61-2.30)	3.96 (3.16-4.78)	6.58 (5.37-7.95)	8.98 (7.07-11.8)	1593
Females (2007 - 2008)	1.42 (1.30-1.55)	1.40 (1.29-1.53)	2.43 (2.22-2.70)	4.18 (3.73-4.74)	5.77 (4.76-7.03)	1294
Females (2009 - 2010)	.855 (.765-.954)	1.04 (.951-1.14)	1.76 (1.60-1.96)	2.79 (2.40-3.18)	3.68 (3.18-4.10)	1404
Mexican Americans (1999 - 2000)	1.46 (1.20-1.77)	1.44 (1.05-1.93)	2.39 (2.09-2.96)	3.86 (3.24-5.09)	5.85 (3.88-9.57)	697
Mexican Americans (2001 - 2002)	1.86 (1.64-2.10)	2.06 (1.85-2.30)	3.79 (3.23-4.46)	6.52 (5.73-7.58)	8.71 (7.68-11.0)	744
Mexican Americans (2007 - 2008)	1.15 (.895-1.46)	1.18 (.941-1.50)	1.97 (1.55-2.38)	3.04 (2.31-4.41)	4.41 (2.92-7.11)	499
Mexican Americans (2009 - 2010)	.796 (.680-.930)	.959 (.821-1.07)	1.58 (1.39-1.76)	2.61 (2.25-2.99)	3.46 (3.16-4.01)	602
Non-Hispanic blacks (1999 - 2000)	1.47 (1.09-1.99)	1.33 (.936-1.94)	2.86 (1.58-5.05)	5.91 (4.05-8.93)	9.02 (5.91-13.7)	521
Non-Hispanic blacks (2001 - 2002)	1.58 (1.19-2.08)	1.95 (1.56-2.48)	3.53 (2.84-4.28)	5.60 (4.68-6.40)	7.21 (5.83-9.11)	775
Non-Hispanic blacks (2007 - 2008)	1.25 (1.05-1.49)	1.24 (1.03-1.47)	2.25 (1.86-2.86)	3.91 (3.13-4.68)	5.39 (4.12-8.30)	573
Non-Hispanic blacks (2009 - 2010)	.694 (.613-.786)	.813 (.698-.981)	1.41 (1.28-1.62)	2.28 (2.00-2.55)	2.93 (2.55-3.50)	504
Non-Hispanic whites (1999 - 2000)	1.66 (1.45-1.91)	1.55 (1.31-1.83)	2.93 (2.09-3.97)	5.56 (4.21-6.75)	8.44 (6.25-12.3)	602
Non-Hispanic whites (2001 - 2002)	1.81 (1.55-2.11)	2.00 (1.65-2.35)	3.91 (3.03-4.91)	6.94 (5.24-9.22)	10.6 (7.76-12.6)	1266
Non-Hispanic whites (2007 - 2008)	1.33 (1.22-1.45)	1.37 (1.26-1.53)	2.31 (2.02-2.54)	3.76 (3.40-4.03)	4.73 (4.35-5.68)	1084
Non-Hispanic whites (2009 - 2010)	.837 (.750-.934)	1.01 (.919-1.12)	1.73 (1.55-1.93)	2.75 (2.40-3.14)	3.64 (3.10-4.36)	1200

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorpyrifos_BiomonitoringSummary.html

Urinary Diethylphosphate (DEP) (1999 – 2008)

CAS Number 598-02-7

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	1.03 (.670-1.58)	1.20 (.750-1.70)	3.20 (2.30-4.80)	7.60 (5.00-12.0)	13.0 (7.70-23.0)	1949
Total population (2001 - 2002)	*	< LOD	2.90 (2.50-3.26)	6.68 (5.78-7.52)	10.6 (9.14-12.0)	3018
Total population (2003 - 2004)	*	< LOD	4.56 (3.57-5.83)	10.2 (9.00-11.5)	15.5 (13.5-16.8)	2453
Total population (2005 - 2006)	*	< LOD	1.46 (.780-2.17)	7.01 (5.67-8.94)	13.3 (10.2-16.0)	2635
Total population (2007 - 2008)	*	< LOD	2.48 (1.44-3.33)	8.74 (7.51-10.3)	15.3 (13.1-17.8)	2591
Age 6-11 years (1999 - 2000)	1.32 (.757-2.29)	1.50 (.860-2.60)	4.50 (2.10-7.90)	11.0 (4.80-24.0)	16.0 (8.50-36.0)	471
Age 6-11 years (2001 - 2002)	*	.290 (<LOD-1.04)	3.45 (2.36-4.47)	9.56 (6.33-18.0)	20.0 (9.44-38.2)	576
Age 6-11 years (2003 - 2004)	*	< LOD	5.13 (2.48-7.94)	10.9 (8.08-15.9)	16.1 (10.9-18.5)	308
Age 6-11 years (2005 - 2006)	*	< LOD	1.45 (<LOD-4.51)	8.21 (4.85-13.4)	13.5 (8.36-20.4)	350
Age 6-11 years (2007 - 2008)	*	< LOD	4.31 (.420-6.49)	12.9 (9.14-17.7)	20.2 (11.9-37.5)	385
Age 12-19 years (1999 - 2000)	1.21 (.758-1.94)	1.40 (.970-2.10)	3.70 (2.40-5.50)	8.00 (4.70-19.0)	20.0 (8.00-27.0)	664
Age 12-19 years (2001 - 2002)	*	< LOD	2.86 (1.96-3.95)	7.58 (5.71-9.15)	11.0 (9.35-12.4)	822
Age 12-19 years (2003 - 2004)	*	.530 (<LOD-2.32)	5.80 (4.34-7.67)	14.8 (9.12-19.8)	20.8 (14.8-32.7)	701
Age 12-19 years (2005 - 2006)	*	< LOD	.460 (<LOD-3.69)	9.47 (4.67-14.1)	14.4 (10.2-22.4)	718
Age 12-19 years (2007 - 2008)	*	< LOD	3.81 (<LOD-5.42)	10.7 (7.76-14.2)	23.3 (11.3-35.6)	391
Age 20-59 years (1999 - 2000)	.955 (.623-1.47)	1.10 (.700-1.60)	3.00 (1.80-4.80)	7.30 (4.70-11.0)	11.0 (6.80-22.0)	814
Age 20-59 years (2001 - 2002)	*	< LOD	2.71 (2.34-3.12)	5.79 (5.05-7.21)	10.4 (7.43-12.3)	1122
Age 20-59 years (2003 - 2004)	*	< LOD	4.37 (3.02-5.81)	9.74 (8.35-11.3)	14.2 (11.5-16.2)	922
Age 20-59 years (2005 - 2006)	*	< LOD	1.13 (<LOD-2.17)	6.15 (4.51-8.24)	11.5 (8.23-15.5)	1092
Age 20-59 years (2007 - 2008)	*	< LOD	1.55 (.470-2.48)	7.54 (6.10-8.98)	14.0 (9.62-15.7)	1178
Age 60+ years (2001 - 2002)	*	.440 (<LOD-1.63)	3.30 (2.63-4.51)	7.06 (5.17-8.69)	9.41 (8.31-10.6)	498
Age 60+ years (2003 - 2004)	*	1.80 (<LOD-2.98)	4.73 (3.98-5.91)	10.0 (8.09-11.3)	13.6 (10.6-16.7)	522
Age 60+ years (2005 - 2006)	*	< LOD	2.69 (1.71-3.95)	8.33 (6.60-12.0)	16.3 (12.0-18.7)	475
Age 60+ years (2007 - 2008)	*	< LOD	3.55 (2.80-5.31)	9.86 (7.53-14.2)	17.1 (12.6-22.1)	637
Males (1999 - 2000)	1.11 (.717-1.73)	1.20 (.810-1.70)	3.80 (2.50-5.00)	8.00 (5.00-19.0)	19.0 (7.20-30.0)	952
Males (2001 - 2002)	*	< LOD	3.21 (2.72-3.56)	6.99 (5.83-7.71)	11.5 (9.36-12.1)	1420
Males (2003 - 2004)	*	< LOD	5.01 (3.90-6.50)	11.0 (10.1-12.7)	16.2 (14.3-18.8)	1198
Males (2005 - 2006)	*	< LOD	.770 (<LOD-1.71)	6.82 (5.14-9.54)	13.4 (9.36-16.1)	1246
Males (2007 - 2008)	*	< LOD	1.95 (<LOD-3.34)	9.39 (7.90-11.8)	17.0 (13.7-21.5)	1295
Females (1999 - 2000)	.954 (.599-1.52)	1.20 (.620-1.70)	2.90 (1.90-4.80)	7.50 (4.60-11.0)	11.0 (7.40-16.0)	997
Females (2001 - 2002)	*	.290 (<LOD-.790)	2.63 (2.22-3.03)	6.21 (4.59-8.64)	10.2 (7.52-14.7)	1598
Females (2003 - 2004)	*	.110 (<LOD-2.29)	4.29 (3.21-5.80)	9.38 (7.95-10.7)	13.3 (11.2-15.9)	1255
Females (2005 - 2006)	*	< LOD	2.15 (1.27-2.76)	7.23 (5.79-9.32)	12.9 (9.64-16.0)	1389
Females (2007 - 2008)	*	< LOD	2.76 (1.69-3.62)	7.76 (6.23-10.7)	14.5 (10.7-18.8)	1296

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.2, 0.2, 0.1, 0.37, and 0.37 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethylphosphate (DEP) (1999 – 2008)

CAS Number 598-02-7

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	1.22 (.740-2.01)	1.20 (.840-1.80)	4.10 (2.20-7.00)	11.0 (6.40-19.0)	18.0 (12.0-27.0)	672
Mexican Americans (2001 - 2002)	*	.600 (<LOD-1.49)	3.07 (2.22-3.83)	6.26 (5.00-7.82)	11.2 (7.82-12.3)	763
Mexican Americans (2003 - 2004)	*	1.18 (<LOD-2.97)	5.81 (3.99-7.59)	11.0 (8.48-16.1)	16.9 (12.1-24.0)	581
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	6.30 (1.57-11.6)	14.9 (5.72-33.5)	695
Mexican Americans (2007 - 2008)	*	< LOD	1.63 (<LOD-3.88)	8.36 (6.44-9.61)	14.8 (8.85-25.1)	501
Non-Hispanic blacks (1999 - 2000)	1.56 (1.13-2.14)	1.60 (1.40-1.80)	4.30 (2.90-5.80)	10.0 (5.60-18.0)	18.0 (8.00-27.0)	509
Non-Hispanic blacks (2001 - 2002)	*	1.03 (<LOD-2.33)	4.81 (3.48-6.52)	9.98 (7.39-13.3)	15.1 (9.81-23.4)	756
Non-Hispanic blacks (2003 - 2004)	*	1.04 (<LOD-3.28)	6.29 (5.05-8.44)	11.9 (9.92-15.5)	16.2 (14.1-22.5)	628
Non-Hispanic blacks (2005 - 2006)	*	< LOD	2.10 (<LOD-4.57)	8.87 (6.52-12.0)	14.3 (11.2-19.1)	723
Non-Hispanic blacks (2007 - 2008)	*	< LOD	3.92 (2.67-5.19)	11.3 (9.44-14.0)	19.5 (14.1-22.0)	574
Non-Hispanic whites (1999 - 2000)	.981 (.579-1.66)	1.10 (.490-2.10)	3.30 (2.20-4.90)	7.70 (4.70-14.0)	14.0 (7.60-25.0)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	2.63 (2.21-3.13)	5.79 (5.05-7.35)	9.90 (8.38-11.7)	1253
Non-Hispanic whites (2003 - 2004)	*	< LOD	4.25 (3.12-5.77)	9.74 (8.37-11.3)	14.4 (12.4-16.0)	1055
Non-Hispanic whites (2005 - 2006)	*	< LOD	1.50 (.900-2.27)	6.82 (5.08-9.74)	13.3 (8.37-16.9)	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	2.14 (1.27-3.03)	7.57 (6.57-8.97)	14.5 (11.4-16.5)	1086

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.2, 0.2, 0.1, 0.37, and 0.37 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethylphosphate (DEP) (creatinine corrected) (1999 – 2008)

CAS Number 598-02-7

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.924 (.608-1.41)	.920 (.570-1.40)	2.73 (1.68-4.60)	7.94 (4.40-12.2)	12.2 (8.00-19.6)	1949
Total population (2001 - 2002)	*	< LOD	2.56 (2.17-2.85)	5.36 (4.75-6.06)	8.72 (7.19-10.3)	3017
Total population (2003 - 2004)	*	< LOD	4.64 (3.82-5.79)	9.18 (7.85-10.8)	13.1 (10.5-16.1)	2450
Total population (2005 - 2006)	*	< LOD	2.23 (1.49-3.09)	7.72 (6.26-9.36)	13.5 (11.0-19.0)	2634
Total population (2007 - 2008)	*	< LOD	3.20 (2.37-4.12)	8.86 (7.52-10.7)	15.7 (11.9-19.8)	2589
Age 6-11 years (1999 - 2000)	1.43 (.870-2.34)	1.47 (1.02-2.41)	3.94 (2.20-8.57)	10.5 (4.55-20.8)	16.6 (10.5-32.7)	471
Age 6-11 years (2001 - 2002)	*	.886 (<LOD-1.76)	4.02 (2.87-5.25)	8.85 (6.88-15.6)	18.4 (9.40-28.8)	576
Age 6-11 years (2003 - 2004)	*	< LOD	6.10 (3.79-9.03)	11.9 (9.54-15.2)	16.1 (11.9-28.3)	308
Age 6-11 years (2005 - 2006)	*	< LOD	3.09 (<LOD-6.77)	9.50 (5.67-17.6)	20.7 (9.50-26.5)	350
Age 6-11 years (2007 - 2008)	*	< LOD	4.67 (2.01-6.96)	17.2 (13.1-20.3)	28.2 (19.3-34.8)	385
Age 12-19 years (1999 - 2000)	.818 (.533-1.26)	.790 (.560-1.25)	2.35 (1.37-3.75)	5.44 (2.82-14.4)	12.4 (4.66-34.2)	664
Age 12-19 years (2001 - 2002)	*	< LOD	2.05 (1.54-2.67)	4.40 (3.40-5.28)	7.28 (5.28-9.75)	821
Age 12-19 years (2003 - 2004)	*	.438 (<LOD-2.05)	4.47 (3.90-5.43)	10.1 (7.10-13.5)	14.7 (9.82-26.4)	699
Age 12-19 years (2005 - 2006)	*	< LOD	1.27 (<LOD-2.81)	6.74 (4.24-9.87)	11.7 (6.98-16.6)	718
Age 12-19 years (2007 - 2008)	*	< LOD	2.86 (<LOD-4.53)	8.56 (5.70-17.0)	17.0 (8.05-23.0)	389
Age 20-59 years (1999 - 2000)	.883 (.574-1.36)	.860 (.500-1.35)	2.66 (1.54-4.95)	7.37 (4.32-12.1)	12.1 (8.00-17.5)	814
Age 20-59 years (2001 - 2002)	*	< LOD	2.28 (2.01-2.56)	4.75 (3.92-5.83)	7.37 (5.93-9.72)	1122
Age 20-59 years (2003 - 2004)	*	< LOD	4.29 (2.98-5.71)	8.35 (6.09-11.3)	11.9 (9.02-14.7)	921
Age 20-59 years (2005 - 2006)	*	< LOD	1.92 (<LOD-2.95)	6.64 (5.22-9.25)	12.3 (9.25-19.4)	1091
Age 20-59 years (2007 - 2008)	*	< LOD	2.38 (1.81-3.27)	7.45 (6.11-9.43)	11.4 (9.22-15.8)	1178
Age 60+ years (2001 - 2002)	*	1.00 (<LOD-1.88)	3.29 (2.74-4.14)	6.52 (4.92-8.21)	9.82 (7.05-14.4)	498
Age 60+ years (2003 - 2004)	*	2.39 (<LOD-3.35)	5.65 (4.36-7.50)	9.44 (8.38-10.5)	13.3 (10.5-18.2)	522
Age 60+ years (2005 - 2006)	*	< LOD	3.75 (2.30-5.14)	9.88 (7.72-12.6)	19.3 (12.6-26.6)	475
Age 60+ years (2007 - 2008)	*	< LOD	5.28 (4.03-6.23)	11.8 (9.36-14.4)	17.7 (13.2-21.9)	637
Males (1999 - 2000)	.855 (.566-1.29)	.820 (.510-1.34)	2.61 (1.76-4.03)	7.69 (4.41-12.1)	12.2 (6.94-23.8)	952
Males (2001 - 2002)	*	< LOD	2.20 (1.86-2.64)	4.49 (3.92-5.31)	7.50 (5.79-9.10)	1420
Males (2003 - 2004)	*	< LOD	4.20 (3.28-5.30)	8.35 (7.10-10.1)	12.0 (9.33-14.7)	1197
Males (2005 - 2006)	*	< LOD	1.16 (<LOD-2.25)	6.24 (4.58-7.63)	10.0 (7.60-17.8)	1246
Males (2007 - 2008)	*	< LOD	2.17 (<LOD-3.23)	8.14 (6.35-10.7)	13.6 (9.79-18.6)	1294
Females (1999 - 2000)	.996 (.620-1.60)	.960 (.540-1.62)	2.81 (1.45-5.85)	8.00 (4.00-13.0)	12.1 (6.67-19.6)	997
Females (2001 - 2002)	*	.778 (<LOD-1.31)	2.81 (2.44-3.33)	6.49 (4.95-7.76)	9.61 (7.12-13.6)	1597
Females (2003 - 2004)	*	.636 (<LOD-2.84)	5.06 (4.03-6.86)	9.85 (8.25-11.8)	13.8 (10.9-20.3)	1253
Females (2005 - 2006)	*	< LOD	3.50 (2.43-4.11)	9.36 (6.91-11.8)	16.5 (12.4-22.3)	1388
Females (2007 - 2008)	*	< LOD	4.09 (2.80-4.91)	9.46 (8.43-11.5)	16.5 (13.1-20.9)	1295

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethylphosphate (DEP) (creatinine corrected) (1999 – 2008)

CAS Number 598-02-7

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	1.09 (.633-1.89)	1.05 (.650-1.98)	3.78 (2.11-6.46)	9.84 (5.66-15.7)	15.7 (8.61-29.0)	672
Mexican Americans (2001 - 2002)	*	.891 (<LOD-1.41)	2.39 (1.77-3.14)	5.17 (4.10-6.53)	8.04 (6.40-10.9)	763
Mexican Americans (2003 - 2004)	*	1.07 (<LOD-2.79)	4.94 (3.30-7.01)	9.94 (7.89-13.3)	16.6 (10.1-22.4)	580
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	6.26 (3.71-10.1)	14.9 (5.75-37.3)	695
Mexican Americans (2007 - 2008)	*	< LOD	3.19 (<LOD-4.27)	8.56 (6.00-10.3)	13.3 (9.77-15.9)	500
Non-Hispanic blacks (1999 - 2000)	1.07 (.773-1.47)	1.18 (.830-1.54)	2.61 (1.89-3.47)	5.98 (3.94-9.56)	11.9 (5.98-22.2)	509
Non-Hispanic blacks (2001 - 2002)	*	.797 (<LOD-1.62)	2.98 (2.57-3.61)	6.91 (5.17-8.69)	9.58 (7.82-12.1)	755
Non-Hispanic blacks (2003 - 2004)	*	.741 (<LOD-2.21)	4.25 (3.46-5.36)	8.30 (6.57-10.7)	11.7 (10.5-13.2)	627
Non-Hispanic blacks (2005 - 2006)	*	< LOD	1.92 (<LOD-3.58)	7.08 (5.16-9.35)	11.4 (8.91-12.3)	722
Non-Hispanic blacks (2007 - 2008)	*	< LOD	3.33 (2.33-4.15)	8.72 (7.27-10.2)	16.7 (11.5-19.4)	573
Non-Hispanic whites (1999 - 2000)	.932 (.549-1.58)	.900 (.430-1.68)	2.87 (1.51-5.88)	8.57 (4.40-14.4)	13.0 (8.21-23.8)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	2.52 (2.08-2.95)	5.26 (4.57-5.93)	8.26 (6.61-10.8)	1253
Non-Hispanic whites (2003 - 2004)	*	< LOD	4.65 (3.73-5.87)	9.12 (7.79-11.2)	12.7 (10.1-15.7)	1054
Non-Hispanic whites (2005 - 2006)	*	< LOD	2.50 (1.74-3.30)	7.72 (6.24-9.25)	13.9 (10.0-19.5)	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	3.10 (2.19-4.18)	8.44 (6.84-9.74)	13.6 (10.9-17.5)	1086

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethylphosphate (DMP) (1999 – 2008)

CAS Number 813-78-5

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	.740 (<LOD-1.40)	2.90 (2.10-4.00)	7.90 (6.20-8.90)	14.0 (10.0-19.0)	1949
Total population (2001 - 2002)	*	< LOD	3.32 (2.90-3.74)	8.40 (7.11-9.23)	13.4 (11.4-14.9)	3017
Total population (2003 - 2004)	*	< LOD	4.15 (3.39-4.94)	9.54 (7.46-11.9)	15.1 (12.8-18.2)	2494
Total population (2005 - 2006)	*	< LOD	5.21 (4.15-6.56)	17.2 (13.8-20.5)	29.6 (24.3-35.2)	2635
Total population (2007 - 2008)	*	< LOD	7.91 (6.64-9.07)	20.8 (18.2-24.4)	35.6 (30.3-39.4)	2593
Age 6-11 years (1999 - 2000)	1.58 (1.15-2.18)	1.10 (.580-2.20)	4.40 (2.80-6.80)	10.0 (7.80-21.0)	22.0 (15.0-33.0)	471
Age 6-11 years (2001 - 2002)	*	.970 (<LOD-2.00)	5.04 (3.31-7.66)	12.2 (9.10-15.1)	18.3 (12.6-41.7)	576
Age 6-11 years (2003 - 2004)	*	< LOD	4.53 (3.34-5.96)	11.0 (5.62-17.9)	16.2 (7.46-28.3)	310
Age 6-11 years (2005 - 2006)	*	< LOD	9.92 (3.24-20.0)	27.1 (16.5-46.6)	46.6 (27.1-63.0)	350
Age 6-11 years (2007 - 2008)	*	< LOD	12.5 (7.22-16.4)	29.7 (20.3-39.1)	43.3 (29.7-62.7)	385
Age 12-19 years (1999 - 2000)	*	.670 (<LOD-1.80)	3.80 (2.50-4.90)	9.90 (6.20-18.0)	22.0 (13.0-29.0)	664
Age 12-19 years (2001 - 2002)	*	.670 (<LOD-1.31)	4.27 (3.41-5.35)	9.27 (7.80-12.3)	14.7 (11.8-21.3)	822
Age 12-19 years (2003 - 2004)	*	1.20 (<LOD-2.27)	4.61 (3.47-6.72)	10.9 (7.90-15.0)	20.9 (12.5-26.8)	717
Age 12-19 years (2005 - 2006)	*	< LOD	7.32 (1.35-12.4)	22.6 (16.1-36.1)	44.0 (27.6-54.0)	718
Age 12-19 years (2007 - 2008)	*	< LOD	10.0 (7.22-14.5)	25.5 (16.8-35.6)	36.2 (25.5-49.6)	391
Age 20-59 years (1999 - 2000)	*	.680 (<LOD-1.30)	2.70 (1.80-3.70)	6.60 (5.70-8.10)	9.70 (8.80-14.0)	814
Age 20-59 years (2001 - 2002)	*	< LOD	2.95 (2.35-3.41)	6.95 (5.80-8.82)	11.5 (9.66-13.7)	1121
Age 20-59 years (2003 - 2004)	*	< LOD	3.75 (2.84-4.88)	8.52 (6.86-10.7)	14.1 (10.8-17.5)	938
Age 20-59 years (2005 - 2006)	*	< LOD	4.09 (2.45-6.03)	13.8 (9.82-19.8)	24.6 (19.8-32.8)	1092
Age 20-59 years (2007 - 2008)	*	< LOD	6.07 (4.26-7.69)	18.0 (13.6-22.6)	30.3 (23.2-37.9)	1180
Age 60+ years (2001 - 2002)	*	.700 (<LOD-1.50)	3.68 (2.91-4.56)	8.93 (6.79-10.7)	14.4 (9.60-19.1)	498
Age 60+ years (2003 - 2004)	*	2.04 (<LOD-2.63)	4.60 (3.83-5.15)	11.3 (7.68-13.4)	16.3 (12.4-19.4)	529
Age 60+ years (2005 - 2006)	*	< LOD	6.75 (4.75-9.32)	16.8 (11.7-22.1)	26.3 (18.9-38.8)	475
Age 60+ years (2007 - 2008)	*	< LOD	10.8 (8.64-13.0)	24.9 (19.2-32.4)	40.5 (32.5-47.4)	637
Males (1999 - 2000)	*	.670 (<LOD-1.30)	2.90 (2.20-4.00)	7.90 (6.00-9.30)	18.0 (10.0-24.0)	952
Males (2001 - 2002)	*	< LOD	3.49 (2.90-4.15)	8.40 (6.95-10.3)	12.8 (11.3-14.7)	1420
Males (2003 - 2004)	*	< LOD	4.03 (3.30-4.91)	8.49 (6.82-11.9)	15.1 (11.3-20.0)	1221
Males (2005 - 2006)	*	< LOD	4.10 (2.37-6.40)	15.9 (12.4-20.9)	28.1 (22.3-36.7)	1246
Males (2007 - 2008)	*	< LOD	7.75 (6.50-9.63)	20.8 (17.6-26.6)	36.1 (27.0-47.4)	1295
Females (1999 - 2000)	*	.790 (<LOD-1.60)	2.90 (2.00-4.20)	7.80 (5.70-9.00)	11.0 (9.00-18.0)	997
Females (2001 - 2002)	*	< LOD	3.06 (2.63-3.63)	8.38 (6.56-9.63)	13.7 (10.9-17.6)	1597
Females (2003 - 2004)	*	1.08 (<LOD-1.92)	4.29 (3.31-5.28)	10.4 (7.64-12.9)	14.8 (13.3-18.0)	1273
Females (2005 - 2006)	*	< LOD	6.40 (5.04-7.21)	18.7 (14.6-20.8)	30.9 (24.6-41.1)	1389
Females (2007 - 2008)	*	< LOD	7.91 (6.18-9.36)	20.6 (16.5-25.5)	34.2 (26.6-41.5)	1298

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.58, 0.5, 0.5, 0.47, and 0.47 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethylphosphate (DMP) (1999 – 2008)

CAS Number 813-78-5

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	1.10 (<LOD-1.80)	3.80 (2.70-5.30)	9.60 (6.00-16.0)	16.0 (8.90-31.0)	672
Mexican Americans (2001 - 2002)	*	.710 (<LOD-1.52)	3.34 (2.45-4.42)	9.13 (7.29-10.7)	14.4 (11.0-20.6)	763
Mexican Americans (2003 - 2004)	*	< LOD	4.37 (3.12-6.86)	10.3 (7.85-17.4)	22.3 (9.61-31.6)	610
Mexican Americans (2005 - 2006)	*	< LOD	2.65 (<LOD-6.47)	18.9 (13.3-27.9)	39.0 (30.0-47.2)	695
Mexican Americans (2007 - 2008)	*	< LOD	6.85 (3.69-8.82)	20.9 (14.1-26.4)	35.6 (26.3-49.4)	501
Non-Hispanic blacks (1999 - 2000)	1.42 (1.16-1.74)	1.00 (.650-1.50)	3.60 (2.50-5.50)	8.90 (6.90-15.0)	21.0 (14.0-24.0)	509
Non-Hispanic blacks (2001 - 2002)	*	.890 (<LOD-2.20)	4.71 (3.68-6.62)	10.7 (8.54-13.9)	19.4 (14.7-22.8)	755
Non-Hispanic blacks (2003 - 2004)	*	< LOD	5.28 (4.18-6.37)	10.8 (8.33-12.5)	15.8 (12.2-23.4)	631
Non-Hispanic blacks (2005 - 2006)	*	< LOD	9.16 (2.74-15.1)	22.7 (18.2-33.7)	42.5 (27.3-61.9)	723
Non-Hispanic blacks (2007 - 2008)	*	< LOD	8.67 (6.43-11.1)	23.7 (18.3-28.6)	38.0 (27.7-48.1)	574
Non-Hispanic whites (1999 - 2000)	*	< LOD	2.90 (1.80-4.20)	7.90 (5.90-9.00)	11.0 (9.00-18.0)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	3.13 (2.49-3.58)	7.79 (6.67-9.22)	12.5 (10.3-14.7)	1253
Non-Hispanic whites (2003 - 2004)	*	< LOD	3.95 (3.23-4.91)	8.83 (6.56-12.5)	14.8 (11.9-20.0)	1061
Non-Hispanic whites (2005 - 2006)	*	< LOD	5.04 (3.60-6.75)	15.3 (11.8-20.5)	27.8 (20.8-36.7)	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	7.46 (6.27-9.03)	20.7 (17.5-25.5)	35.6 (28.7-39.1)	1088

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.58, 0.5, 0.5, 0.47, and 0.47 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethylphosphate (DMP) (creatinine corrected) (1999 – 2008)

CAS Number 813-78-5

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	.810 (<LOD-1.15)	2.93 (2.11-3.92)	8.50 (6.96-10.4)	16.1 (13.3-17.6)	1949
Total population (2001 - 2002)	*	< LOD	3.16 (2.69-3.59)	8.00 (7.12-9.28)	12.9 (11.5-15.0)	3016
Total population (2003 - 2004)	*	< LOD	4.05 (3.50-5.15)	9.96 (8.78-11.2)	15.0 (13.0-18.1)	2491
Total population (2005 - 2006)	*	< LOD	5.97 (4.75-7.43)	18.0 (15.9-20.5)	27.9 (24.0-32.7)	2634
Total population (2007 - 2008)	*	< LOD	9.10 (8.08-10.2)	20.0 (18.0-24.2)	33.6 (28.8-40.2)	2591
Age 6-11 years (1999 - 2000)	1.71 (1.29-2.27)	1.38 (.890-2.38)	4.48 (2.88-7.89)	16.7 (8.21-21.2)	22.1 (19.2-30.1)	471
Age 6-11 years (2001 - 2002)	*	1.93 (<LOD-2.97)	5.99 (4.32-8.28)	12.9 (9.34-18.5)	20.6 (13.3-34.8)	576
Age 6-11 years (2003 - 2004)	*	< LOD	6.87 (3.80-9.00)	13.9 (9.68-19.3)	19.6 (13.9-25.9)	310
Age 6-11 years (2005 - 2006)	*	< LOD	12.4 (6.71-21.9)	41.2 (23.4-62.2)	71.5 (37.9-107)	350
Age 6-11 years (2007 - 2008)	*	< LOD	15.6 (10.8-21.6)	35.3 (27.6-39.2)	54.3 (36.5-67.1)	385
Age 12-19 years (1999 - 2000)	*	.590 (<LOD-.950)	2.28 (1.70-2.80)	7.78 (4.16-14.4)	16.0 (8.70-35.3)	664
Age 12-19 years (2001 - 2002)	*	.913 (<LOD-1.27)	3.29 (2.76-3.78)	6.29 (5.51-7.30)	9.83 (7.94-14.2)	821
Age 12-19 years (2003 - 2004)	*	1.00 (<LOD-1.68)	4.16 (3.37-5.07)	8.81 (7.78-10.2)	12.7 (10.3-17.7)	715
Age 12-19 years (2005 - 2006)	*	< LOD	5.89 (2.00-10.1)	18.1 (13.9-24.0)	28.9 (19.9-37.9)	718
Age 12-19 years (2007 - 2008)	*	< LOD	9.10 (5.62-10.9)	19.9 (15.5-22.5)	26.1 (19.8-27.2)	389
Age 20-59 years (1999 - 2000)	*	.760 (<LOD-1.12)	2.88 (1.89-3.99)	8.11 (5.89-10.3)	14.6 (10.4-16.8)	814
Age 20-59 years (2001 - 2002)	*	< LOD	2.55 (2.05-3.03)	6.92 (5.85-8.00)	11.5 (9.38-13.6)	1121
Age 20-59 years (2003 - 2004)	*	< LOD	3.77 (2.72-4.55)	8.78 (6.68-10.5)	13.5 (11.2-15.6)	937
Age 20-59 years (2005 - 2006)	*	< LOD	4.71 (3.22-6.50)	16.3 (13.3-18.7)	24.0 (19.9-27.6)	1091
Age 20-59 years (2007 - 2008)	*	< LOD	7.32 (6.02-8.62)	17.2 (13.0-20.0)	28.2 (19.3-40.7)	1180
Age 60+ years (2001 - 2002)	*	1.46 (<LOD-2.00)	4.31 (3.44-5.39)	10.6 (7.92-12.0)	14.3 (11.8-18.5)	498
Age 60+ years (2003 - 2004)	*	2.19 (<LOD-2.69)	5.88 (4.65-7.51)	12.3 (9.79-14.8)	17.4 (13.0-24.2)	529
Age 60+ years (2005 - 2006)	*	< LOD	9.16 (6.36-11.1)	19.7 (13.7-26.4)	30.5 (22.0-46.2)	475
Age 60+ years (2007 - 2008)	*	< LOD	12.9 (10.5-15.3)	29.9 (20.9-38.5)	45.5 (30.5-80.3)	637
Males (1999 - 2000)	*	.620 (<LOD-.940)	2.38 (1.86-3.18)	7.58 (4.64-11.6)	15.2 (9.74-19.5)	952
Males (2001 - 2002)	*	< LOD	2.77 (2.32-3.19)	7.06 (5.44-8.80)	11.2 (9.70-12.7)	1420
Males (2003 - 2004)	*	< LOD	3.27 (2.55-3.94)	8.58 (6.79-10.4)	12.5 (10.5-15.4)	1220
Males (2005 - 2006)	*	< LOD	4.15 (2.16-5.95)	14.7 (11.1-18.0)	21.9 (18.9-26.9)	1246
Males (2007 - 2008)	*	< LOD	7.08 (5.54-8.54)	17.5 (15.1-20.4)	28.0 (21.2-35.4)	1294
Females (1999 - 2000)	*	1.00 (<LOD-1.71)	3.63 (2.30-5.19)	9.12 (7.82-11.7)	16.4 (11.7-19.7)	997
Females (2001 - 2002)	*	< LOD	3.50 (2.86-4.49)	9.09 (7.83-10.8)	15.0 (12.5-17.8)	1596
Females (2003 - 2004)	*	1.67 (<LOD-2.25)	5.28 (4.05-6.49)	11.2 (9.65-13.8)	18.1 (14.8-20.6)	1271
Females (2005 - 2006)	*	< LOD	8.22 (6.99-9.20)	22.0 (17.7-24.9)	37.9 (27.0-47.2)	1388
Females (2007 - 2008)	*	< LOD	10.7 (9.10-12.4)	24.3 (19.5-28.2)	38.6 (27.2-54.6)	1297

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethylphosphate (DMP) (creatinine corrected) (1999 – 2008)

CAS Number 813-78-5

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	1.06 (<LOD-1.55)	3.89 (2.54-5.45)	9.41 (7.69-11.5)	16.7 (11.7-23.6)	672
Mexican Americans (2001 - 2002)	*	.947 (<LOD-1.35)	3.18 (2.54-3.80)	8.44 (6.24-10.9)	14.3 (11.4-16.2)	763
Mexican Americans (2003 - 2004)	*	< LOD	4.16 (2.57-6.30)	12.3 (7.50-16.5)	18.8 (15.3-21.5)	609
Mexican Americans (2005 - 2006)	*	< LOD	4.27 (<LOD-8.50)	19.1 (14.9-22.7)	29.9 (23.8-39.0)	695
Mexican Americans (2007 - 2008)	*	< LOD	7.47 (5.57-9.46)	19.9 (16.8-24.7)	29.8 (24.7-33.4)	500
Non-Hispanic blacks (1999 - 2000)	.973 (.780-1.21)	.690 (.530-1.06)	2.67 (1.89-3.77)	7.07 (5.09-11.4)	14.0 (10.6-19.1)	509
Non-Hispanic blacks (2001 - 2002)	*	.851 (<LOD-1.34)	3.36 (2.68-4.22)	7.63 (6.35-9.18)	13.2 (10.1-14.9)	754
Non-Hispanic blacks (2003 - 2004)	*	< LOD	3.70 (2.84-4.48)	7.52 (6.59-8.89)	12.7 (8.89-19.3)	630
Non-Hispanic blacks (2005 - 2006)	*	< LOD	5.89 (2.56-8.89)	18.7 (13.1-26.4)	29.9 (24.0-38.7)	722
Non-Hispanic blacks (2007 - 2008)	*	< LOD	6.75 (4.80-8.65)	20.1 (15.5-25.1)	30.7 (24.2-37.7)	573
Non-Hispanic whites (1999 - 2000)	*	< LOD	3.15 (1.97-4.32)	8.73 (5.89-13.3)	15.8 (10.0-21.2)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	3.12 (2.50-3.76)	8.30 (6.91-10.0)	13.6 (11.2-16.9)	1253
Non-Hispanic whites (2003 - 2004)	*	< LOD	4.05 (3.49-5.64)	10.2 (8.83-11.8)	14.8 (12.1-19.2)	1060
Non-Hispanic whites (2005 - 2006)	*	< LOD	5.97 (4.53-8.08)	17.7 (15.2-20.6)	26.3 (23.3-29.3)	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	9.33 (7.92-10.8)	20.0 (17.5-24.2)	35.1 (27.2-43.9)	1088

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethylthiophosphate (DETP) (1999 – 2008)

CAS Number 5871-17-0

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	.500 (<LOD-.690)	.760 (.620-1.10)	1.40 (1.10-1.80)	2.20 (1.70-2.80)	1949
Total population (2001 - 2002)	.484 (.381-.615)	.630 (.450-.930)	1.53 (1.33-1.80)	2.57 (2.28-3.01)	3.94 (3.26-4.94)	3016
Total population (2003 - 2004)	*	< LOD	.830 (.710-.960)	1.83 (1.51-2.30)	3.00 (2.39-3.78)	2422
Total population (2005 - 2006)	*	< LOD	.620 (<LOD-.710)	1.43 (1.17-1.84)	2.55 (1.94-3.37)	2634
Total population (2007 - 2008)	*	< LOD	1.00 (.880-1.16)	2.18 (1.75-2.75)	4.35 (2.95-6.01)	2590
Age 6-11 years (1999 - 2000)	*	.600 (<LOD-.810)	.910 (.720-1.30)	1.70 (1.20-3.20)	3.20 (1.70-7.30)	471
Age 6-11 years (2001 - 2002)	.453 (.350-.585)	.550 (.350-.850)	1.58 (1.33-2.04)	2.75 (2.22-3.38)	4.08 (2.95-5.16)	575
Age 6-11 years (2003 - 2004)	*	< LOD	.820 (.580-.970)	1.45 (1.05-2.16)	2.18 (1.45-4.13)	296
Age 6-11 years (2005 - 2006)	*	< LOD	.700 (<LOD-.950)	1.38 (1.03-2.05)	2.15 (1.37-4.06)	350
Age 6-11 years (2007 - 2008)	*	< LOD	1.18 (.990-1.42)	2.93 (2.06-5.58)	6.44 (2.87-13.2)	385
Age 12-19 years (1999 - 2000)	*	.210 (<LOD-.710)	.780 (.600-1.20)	1.50 (1.20-2.30)	2.30 (1.60-4.30)	664
Age 12-19 years (2001 - 2002)	.505 (.388-.657)	.690 (.440-.960)	1.61 (1.32-1.94)	2.57 (2.23-3.39)	4.08 (2.73-5.86)	822
Age 12-19 years (2003 - 2004)	*	.260 (<LOD-.400)	.930 (.750-1.13)	2.14 (1.75-2.89)	3.27 (2.69-4.83)	690
Age 12-19 years (2005 - 2006)	*	< LOD	.700 (<LOD-.920)	1.42 (1.07-1.94)	2.46 (1.47-4.42)	717
Age 12-19 years (2007 - 2008)	*	< LOD	1.04 (.880-1.45)	2.20 (1.58-3.11)	4.02 (2.16-7.07)	390
Age 20-59 years (1999 - 2000)	*	.490 (<LOD-.670)	.740 (.600-.930)	1.30 (.990-1.80)	2.00 (1.50-2.60)	814
Age 20-59 years (2001 - 2002)	.449 (.340-.592)	.540 (.380-.880)	1.45 (1.19-1.79)	2.46 (2.11-3.17)	3.83 (2.96-5.34)	1122
Age 20-59 years (2003 - 2004)	*	< LOD	.800 (.650-.960)	1.76 (1.37-2.32)	2.65 (2.31-3.89)	919
Age 20-59 years (2005 - 2006)	*	< LOD	.600 (<LOD-.680)	1.42 (1.12-1.77)	2.45 (1.82-3.31)	1092
Age 20-59 years (2007 - 2008)	*	< LOD	.930 (.780-1.22)	2.16 (1.68-2.76)	4.20 (2.76-5.92)	1179
Age 60+ years (2001 - 2002)	.662 (.571-.768)	1.00 (.740-1.14)	1.77 (1.50-2.10)	2.81 (2.44-3.46)	4.45 (2.93-8.31)	497
Age 60+ years (2003 - 2004)	*	.310 (<LOD-.520)	.890 (.740-1.05)	1.99 (1.52-2.67)	3.72 (2.19-6.81)	517
Age 60+ years (2005 - 2006)	*	< LOD	.660 (<LOD-.840)	1.62 (1.25-2.31)	3.20 (2.04-4.18)	475
Age 60+ years (2007 - 2008)	*	< LOD	.980 (.860-1.16)	2.04 (1.60-3.01)	4.25 (2.76-5.40)	636
Males (1999 - 2000)	*	.510 (<LOD-.700)	.790 (.680-1.10)	1.50 (1.20-2.20)	2.70 (1.90-4.10)	952
Males (2001 - 2002)	.495 (.393-.623)	.660 (.470-.900)	1.53 (1.37-1.82)	2.68 (2.28-3.34)	3.96 (3.07-5.85)	1419
Males (2003 - 2004)	*	.250 (<LOD-.380)	.890 (.780-1.04)	2.20 (1.65-2.41)	3.15 (2.42-4.29)	1174
Males (2005 - 2006)	*	< LOD	.590 (<LOD-.720)	1.48 (1.15-1.97)	2.61 (1.89-3.58)	1246
Males (2007 - 2008)	*	< LOD	1.03 (.890-1.25)	2.49 (1.82-3.29)	4.79 (3.44-5.92)	1293
Females (1999 - 2000)	*	< LOD	.720 (.570-1.00)	1.30 (.910-1.60)	1.70 (1.30-3.20)	997
Females (2001 - 2002)	.474 (.360-.624)	.620 (.410-.960)	1.51 (1.22-1.86)	2.49 (2.15-3.04)	3.94 (2.82-5.27)	1597
Females (2003 - 2004)	*	< LOD	.770 (.600-.930)	1.59 (1.24-2.08)	2.67 (2.07-3.81)	1248
Females (2005 - 2006)	*	< LOD	.630 (.580-.710)	1.43 (1.14-1.77)	2.42 (1.78-3.52)	1388
Females (2007 - 2008)	*	< LOD	.960 (.840-1.14)	2.00 (1.60-2.50)	4.01 (2.41-6.59)	1297

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.09, 0.1, 0.2, 0.56, and 0.56 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethylthiophosphate (DETP) (1999 – 2008)

CAS Number 5871-17-0

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	.570 (<LOD-.780)	.840 (.740-.980)	1.50 (1.20-1.90)	2.20 (2.00-2.90)	672
Mexican Americans (2001 - 2002)	.549 (.403-.749)	.710 (.470-.960)	1.40 (1.04-1.97)	2.63 (2.06-3.14)	3.98 (2.75-5.21)	763
Mexican Americans (2003 - 2004)	*	.250 (<LOD-.380)	.970 (.720-1.52)	2.35 (1.69-3.83)	4.19 (2.38-8.80)	584
Mexican Americans (2005 - 2006)	*	< LOD	.700 (<LOD-.900)	1.42 (.980-2.48)	2.72 (1.42-4.48)	695
Mexican Americans (2007 - 2008)	*	< LOD	.970 (.830-1.15)	1.98 (1.60-2.65)	3.46 (2.78-4.46)	500
Non-Hispanic blacks (1999 - 2000)	.343 (.201-.584)	.570 (<LOD-.750)	.820 (.690-1.20)	1.80 (1.30-3.20)	3.60 (2.00-4.80)	509
Non-Hispanic blacks (2001 - 2002)	.755 (.589-.966)	1.17 (.740-1.46)	1.85 (1.73-1.99)	3.54 (2.95-3.87)	5.27 (3.89-6.74)	755
Non-Hispanic blacks (2003 - 2004)	.466 (.384-.564)	.430 (.210-.710)	1.08 (.930-1.29)	2.32 (1.74-2.70)	3.25 (2.55-4.83)	605
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.850 (.640-1.18)	1.74 (1.43-2.27)	2.96 (2.09-4.20)	722
Non-Hispanic blacks (2007 - 2008)	*	< LOD	1.23 (.890-1.40)	2.85 (2.05-4.12)	4.81 (4.00-6.59)	574
Non-Hispanic whites (1999 - 2000)	*	.160 (<LOD-.700)	.740 (.580-1.10)	1.30 (.960-1.90)	1.90 (1.50-2.80)	595
Non-Hispanic whites (2001 - 2002)	.464 (.344-.626)	.600 (.410-.950)	1.53 (1.27-1.83)	2.46 (2.15-3.17)	3.75 (2.82-5.54)	1252
Non-Hispanic whites (2003 - 2004)	*	< LOD	.750 (.610-.890)	1.75 (1.33-2.20)	2.68 (2.20-3.78)	1044
Non-Hispanic whites (2005 - 2006)	*	< LOD	.600 (<LOD-.690)	1.42 (1.04-1.99)	2.56 (1.82-3.70)	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	.910 (.820-1.04)	1.80 (1.56-2.46)	3.52 (2.20-5.61)	1087

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.09, 0.1, 0.2, 0.56, and 0.56 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethylthiophosphate (DETP) (creatinine corrected) (1999 – 2008)

CAS Number 5871-17-0

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	.250 (<LOD-.480)	.710 (.460-1.07)	1.72 (1.17-2.32)	2.64 (2.08-3.06)	1949
Total population (2001 - 2002)	.496 (.388-.636)	.569 (.403-.789)	1.42 (1.16-1.79)	3.11 (2.58-3.82)	4.88 (3.78-6.65)	3015
Total population (2003 - 2004)	*	< LOD	.740 (.667-.839)	1.59 (1.32-2.05)	2.87 (2.22-3.77)	2420
Total population (2005 - 2006)	*	< LOD	.956 (<LOD-1.09)	1.88 (1.67-2.21)	2.89 (2.35-3.37)	2633
Total population (2007 - 2008)	*	< LOD	1.24 (1.15-1.37)	2.46 (1.98-3.11)	3.92 (3.05-5.12)	2588
Age 6-11 years (1999 - 2000)	*	.470 (<LOD-.870)	1.08 (.800-1.32)	1.75 (1.44-2.36)	2.45 (2.04-5.32)	471
Age 6-11 years (2001 - 2002)	.591 (.471-.742)	.636 (.397-1.05)	1.63 (1.31-1.94)	3.22 (2.72-4.16)	5.70 (3.84-6.80)	575
Age 6-11 years (2003 - 2004)	*	< LOD	.869 (.592-1.09)	1.57 (1.08-2.67)	2.67 (1.57-4.05)	296
Age 6-11 years (2005 - 2006)	*	< LOD	1.23 (<LOD-1.33)	1.95 (1.60-2.86)	3.97 (1.95-5.88)	350
Age 6-11 years (2007 - 2008)	*	< LOD	1.89 (1.32-2.09)	3.74 (2.46-5.55)	6.54 (3.49-16.0)	385
Age 12-19 years (1999 - 2000)	*	.180 (<LOD-.400)	.510 (.320-.820)	1.07 (.720-1.61)	1.97 (1.07-3.92)	664
Age 12-19 years (2001 - 2002)	.393 (.300-.515)	.534 (.313-.735)	1.23 (.978-1.53)	2.19 (1.61-3.07)	3.14 (2.25-3.97)	821
Age 12-19 years (2003 - 2004)	*	.300 (<LOD-.354)	.645 (.559-.734)	1.49 (1.16-1.60)	1.97 (1.57-2.43)	689
Age 12-19 years (2005 - 2006)	*	< LOD	.710 (<LOD-.889)	1.35 (1.00-2.03)	2.21 (1.35-3.33)	717
Age 12-19 years (2007 - 2008)	*	< LOD	.902 (.692-1.15)	1.78 (1.15-3.32)	3.32 (1.68-5.48)	388
Age 20-59 years (1999 - 2000)	*	.250 (<LOD-.460)	.680 (.440-1.08)	1.79 (1.08-2.39)	2.75 (2.02-3.22)	814
Age 20-59 years (2001 - 2002)	.447 (.335-.597)	.494 (.316-.742)	1.32 (.986-1.71)	2.87 (2.08-3.95)	4.69 (3.20-7.81)	1122
Age 20-59 years (2003 - 2004)	*	< LOD	.700 (.550-.875)	1.47 (1.11-2.23)	2.82 (2.02-3.81)	918
Age 20-59 years (2005 - 2006)	*	< LOD	.913 (<LOD-1.13)	1.84 (1.65-2.11)	2.86 (2.25-3.33)	1091
Age 20-59 years (2007 - 2008)	*	< LOD	1.24 (1.09-1.40)	2.27 (1.79-3.07)	3.51 (2.59-4.78)	1179
Age 60+ years (2001 - 2002)	.821 (.708-.952)	.971 (.849-1.10)	2.25 (1.81-2.66)	3.97 (3.33-5.06)	5.51 (4.79-8.07)	497
Age 60+ years (2003 - 2004)	*	.491 (<LOD-.560)	.933 (.814-1.17)	2.14 (1.46-3.00)	3.92 (2.28-8.15)	517
Age 60+ years (2005 - 2006)	*	< LOD	1.11 (<LOD-1.38)	2.50 (1.67-3.11)	3.80 (2.86-8.71)	475
Age 60+ years (2007 - 2008)	*	< LOD	1.32 (1.20-1.58)	2.91 (2.25-3.38)	4.49 (3.05-9.80)	636
Males (1999 - 2000)	*	.270 (<LOD-.470)	.670 (.520-.840)	1.34 (1.08-2.17)	2.67 (1.67-3.23)	952
Males (2001 - 2002)	.410 (.319-.526)	.517 (.342-.721)	1.22 (1.02-1.41)	2.46 (1.71-3.18)	3.67 (2.70-4.71)	1419
Males (2003 - 2004)	*	.276 (<LOD-.326)	.667 (.560-.804)	1.49 (1.15-1.91)	2.87 (1.74-3.72)	1173
Males (2005 - 2006)	*	< LOD	.773 (<LOD-.907)	1.42 (1.21-2.00)	2.35 (1.90-3.27)	1246
Males (2007 - 2008)	*	< LOD	1.02 (.943-1.09)	1.94 (1.60-2.39)	3.22 (2.50-4.42)	1292
Females (1999 - 2000)	*	< LOD	.790 (.380-1.50)	1.89 (1.07-2.52)	2.52 (1.89-3.75)	997
Females (2001 - 2002)	.597 (.457-.779)	.647 (.423-.961)	1.77 (1.34-2.50)	3.82 (2.93-5.14)	6.57 (4.34-9.28)	1596
Females (2003 - 2004)	*	< LOD	.821 (.700-.946)	1.76 (1.34-2.29)	3.02 (2.25-4.33)	1247
Females (2005 - 2006)	*	< LOD	1.17 (1.03-1.38)	2.21 (1.83-2.50)	3.18 (2.50-4.47)	1387
Females (2007 - 2008)	*	< LOD	1.47 (1.28-1.72)	2.86 (2.29-3.51)	4.48 (3.30-5.73)	1296

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethylthiophosphate (DETP) (creatinine corrected) (1999 – 2008)

CAS Number 5871-17-0

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	.330 (<LOD-.790)	.830 (.550-1.20)	1.69 (1.20-2.43)	2.71 (1.75-3.78)	672
Mexican Americans (2001 - 2002)	.520 (.390-.693)	.570 (.416-.824)	1.30 (1.05-1.74)	2.58 (1.82-3.72)	3.82 (2.77-6.43)	763
Mexican Americans (2003 - 2004)	*	.329 (<LOD-.414)	.824 (.555-1.22)	2.03 (1.26-3.63)	3.74 (2.47-6.18)	584
Mexican Americans (2005 - 2006)	*	< LOD	.907 (<LOD-1.10)	1.74 (1.35-2.07)	2.86 (2.02-4.00)	695
Mexican Americans (2007 - 2008)	*	< LOD	1.20 (.989-1.32)	2.20 (1.83-2.86)	3.32 (2.59-5.11)	499
Non-Hispanic blacks (1999 - 2000)	.234 (.136-.403)	.310 (<LOD-.580)	.720 (.510-.850)	1.39 (1.03-2.10)	2.91 (1.49-4.24)	509
Non-Hispanic blacks (2001 - 2002)	.556 (.457-.676)	.726 (.565-.938)	1.50 (1.34-1.70)	2.80 (2.35-3.30)	4.00 (3.29-4.99)	754
Non-Hispanic blacks (2003 - 2004)	.321 (.270-.381)	.313 (.231-.407)	.699 (.561-.831)	1.45 (1.09-1.75)	2.64 (1.71-3.64)	604
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.720 (.606-.824)	1.48 (1.24-1.73)	2.45 (1.76-3.19)	721
Non-Hispanic blacks (2007 - 2008)	*	< LOD	1.07 (.880-1.21)	2.40 (1.85-2.89)	4.12 (3.19-5.67)	573
Non-Hispanic whites (1999 - 2000)	*	.230 (<LOD-.550)	.710 (.390-1.22)	1.88 (1.05-2.58)	2.64 (2.08-3.07)	595
Non-Hispanic whites (2001 - 2002)	.506 (.373-.687)	.579 (.368-.850)	1.51 (1.18-2.00)	3.38 (2.64-4.35)	5.83 (3.95-7.81)	1252
Non-Hispanic whites (2003 - 2004)	*	< LOD	.735 (.636-.848)	1.52 (1.20-2.07)	2.69 (2.07-3.97)	1043
Non-Hispanic whites (2005 - 2006)	*	< LOD	1.00 (<LOD-1.21)	2.00 (1.73-2.27)	3.08 (2.50-3.74)	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	1.24 (1.07-1.39)	2.28 (1.71-3.30)	3.49 (2.56-4.60)	1087

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethylthiophosphate (DMTP) (1999 – 2008)

CAS Number 59401-04-6

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	1.82 (1.36-2.44)	2.70 (1.40-4.10)	11.0 (8.40-16.0)	38.0 (25.0-41.0)	48.0 (38.0-62.0)	1948
Total population (2001 - 2002)	*	.580 (<LOD-1.45)	4.23 (3.10-5.88)	17.5 (13.0-22.7)	32.9 (27.2-45.3)	3016
Total population (2003 - 2004)	2.25 (1.98-2.56)	2.03 (1.73-2.37)	6.36 (5.11-7.34)	19.6 (16.2-21.5)	35.3 (27.4-45.3)	2494
Total population (2005 - 2006)	1.96 (1.74-2.20)	1.71 (1.43-1.94)	5.34 (4.49-6.08)	14.2 (10.5-20.8)	28.2 (22.1-36.0)	2631
Total population (2007 - 2008)	2.28 (1.97-2.64)	2.10 (1.77-2.44)	5.90 (4.94-7.01)	18.3 (13.5-23.0)	36.8 (27.8-45.7)	2591
Age 6-11 years (1999 - 2000)	2.72 (1.93-3.85)	4.20 (2.50-7.20)	20.0 (13.0-29.0)	40.0 (38.0-52.0)	62.0 (40.0-92.0)	471
Age 6-11 years (2001 - 2002)	*	1.46 (.600-2.69)	8.33 (5.75-14.0)	28.4 (19.7-41.4)	45.7 (28.5-74.5)	575
Age 6-11 years (2003 - 2004)	2.79 (2.25-3.45)	2.67 (1.81-3.88)	6.95 (5.64-8.58)	19.4 (10.5-27.4)	30.9 (19.4-76.5)	310
Age 6-11 years (2005 - 2006)	2.70 (2.25-3.26)	2.38 (1.76-3.33)	8.21 (4.96-11.8)	21.4 (12.7-40.7)	40.7 (18.3-90.4)	349
Age 6-11 years (2007 - 2008)	3.43 (2.88-4.09)	3.50 (2.69-4.10)	9.90 (7.14-13.9)	32.0 (19.1-45.7)	52.5 (36.7-67.4)	385
Age 12-19 years (1999 - 2000)	2.53 (1.64-3.92)	3.70 (1.70-6.80)	16.0 (11.0-31.0)	38.0 (33.0-58.0)	69.0 (38.0-260)	664
Age 12-19 years (2001 - 2002)	*	1.04 (<LOD-2.12)	4.83 (3.35-6.48)	20.8 (12.2-27.9)	34.9 (23.6-54.7)	822
Age 12-19 years (2003 - 2004)	2.21 (1.81-2.70)	1.83 (1.46-2.16)	5.91 (4.04-8.78)	18.7 (12.2-33.9)	47.1 (22.2-80.8)	717
Age 12-19 years (2005 - 2006)	2.51 (2.00-3.16)	2.53 (1.90-3.02)	6.44 (4.91-8.77)	21.7 (13.1-28.2)	38.5 (25.3-79.2)	717
Age 12-19 years (2007 - 2008)	2.10 (1.68-2.61)	1.82 (1.53-2.31)	5.18 (3.55-7.48)	13.6 (8.16-27.9)	31.5 (12.4-54.5)	391
Age 20-59 years (1999 - 2000)	1.59 (1.17-2.16)	2.30 (.830-3.80)	9.10 (7.10-13.0)	38.0 (19.0-39.0)	39.0 (38.0-58.0)	813
Age 20-59 years (2001 - 2002)	*	< LOD	3.32 (2.29-4.96)	13.6 (9.50-20.0)	30.0 (20.5-45.3)	1121
Age 20-59 years (2003 - 2004)	1.98 (1.71-2.30)	1.78 (1.48-2.18)	5.11 (4.31-6.53)	16.7 (12.1-20.8)	28.5 (24.1-40.0)	938
Age 20-59 years (2005 - 2006)	1.72 (1.50-1.97)	1.37 (1.20-1.73)	4.25 (3.68-5.22)	12.4 (8.37-19.6)	26.6 (16.4-37.9)	1092
Age 20-59 years (2007 - 2008)	2.03 (1.68-2.46)	1.90 (1.46-2.39)	5.18 (4.24-6.09)	13.3 (10.4-19.2)	30.6 (21.4-44.6)	1179
Age 60+ years (2001 - 2002)	*	.860 (<LOD-2.16)	5.85 (3.33-9.56)	19.6 (13.0-27.9)	32.9 (22.7-51.0)	498
Age 60+ years (2003 - 2004)	3.18 (2.47-4.08)	2.64 (2.16-3.81)	9.63 (6.32-15.5)	25.0 (15.5-45.3)	45.3 (20.9-119)	529
Age 60+ years (2005 - 2006)	2.18 (1.81-2.63)	2.03 (1.46-2.68)	6.38 (4.62-8.23)	14.0 (9.72-20.9)	25.2 (18.2-37.6)	473
Age 60+ years (2007 - 2008)	2.91 (2.37-3.58)	2.57 (1.99-3.18)	9.19 (5.54-13.0)	26.2 (19.4-32.5)	42.7 (30.5-54.1)	636
Males (1999 - 2000)	2.10 (1.48-2.98)	3.50 (2.20-4.80)	14.0 (8.00-24.0)	38.0 (21.0-49.0)	42.0 (38.0-53.0)	952
Males (2001 - 2002)	*	.690 (<LOD-1.52)	4.44 (3.32-6.48)	18.3 (12.7-25.6)	31.1 (25.0-43.3)	1420
Males (2003 - 2004)	2.30 (1.95-2.70)	2.15 (1.70-2.53)	6.42 (4.90-7.75)	18.8 (13.3-22.5)	30.0 (23.3-45.3)	1221
Males (2005 - 2006)	1.88 (1.64-2.14)	1.61 (1.28-1.94)	5.38 (3.96-6.38)	13.1 (9.59-20.9)	28.7 (19.5-41.7)	1243
Males (2007 - 2008)	2.33 (2.00-2.71)	2.15 (1.85-2.50)	5.98 (4.78-7.26)	16.7 (11.8-24.7)	31.5 (21.2-48.9)	1293
Females (1999 - 2000)	1.59 (1.23-2.06)	2.00 (.690-3.60)	9.70 (7.30-14.0)	38.0 (26.0-39.0)	52.0 (38.0-110)	996
Females (2001 - 2002)	*	.430 (<LOD-1.45)	3.81 (2.68-5.85)	16.0 (10.9-22.7)	35.2 (25.0-46.1)	1596
Females (2003 - 2004)	2.21 (1.92-2.55)	1.95 (1.68-2.29)	6.27 (4.93-7.39)	20.4 (16.4-24.0)	36.7 (27.7-47.8)	1273
Females (2005 - 2006)	2.04 (1.79-2.33)	1.75 (1.46-2.13)	5.23 (4.49-6.10)	15.6 (10.9-20.8)	28.1 (20.8-37.9)	1388
Females (2007 - 2008)	2.24 (1.88-2.66)	1.99 (1.57-2.52)	5.85 (4.92-7.31)	18.7 (13.4-26.0)	37.7 (27.0-50.1)	1298

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.18, 0.4, 0.5, 0.55, and 0.55 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethylthiophosphate (DMTP) (1999 – 2008)

CAS Number 59401-04-6

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	1.79 (1.05-3.05)	2.00 (.530-4.40)	11.0 (6.70-17.0)	39.0 (32.0-62.0)	140 (46.0-230)	671
Mexican Americans (2001 - 2002)	*	< LOD	3.93 (3.05-5.06)	15.1 (11.1-19.1)	35.6 (22.7-46.0)	763
Mexican Americans (2003 - 2004)	2.41 (1.88-3.09)	2.54 (1.41-3.98)	6.43 (4.90-8.02)	17.2 (12.0-22.3)	28.9 (19.2-39.8)	610
Mexican Americans (2005 - 2006)	2.37 (2.07-2.71)	2.26 (1.95-2.68)	5.65 (4.86-6.44)	16.4 (12.9-21.4)	28.3 (23.3-41.4)	693
Mexican Americans (2007 - 2008)	2.10 (1.83-2.42)	1.98 (1.63-2.31)	5.18 (4.17-6.61)	13.6 (11.5-20.0)	31.0 (20.0-43.5)	501
Non-Hispanic blacks (1999 - 2000)	2.13 (1.57-2.88)	3.60 (2.10-4.70)	12.0 (8.80-18.0)	38.0 (20.0-41.0)	41.0 (37.0-110)	509
Non-Hispanic blacks (2001 - 2002)	1.54 (1.15-2.07)	1.18 (.580-1.97)	5.21 (3.11-8.25)	20.0 (13.4-27.2)	39.1 (25.9-62.8)	755
Non-Hispanic blacks (2003 - 2004)	2.13 (1.83-2.48)	1.85 (1.65-2.20)	5.44 (3.87-8.28)	20.4 (15.8-24.9)	31.1 (24.9-51.9)	631
Non-Hispanic blacks (2005 - 2006)	1.94 (1.63-2.31)	1.63 (1.23-2.02)	5.21 (3.93-7.18)	16.8 (13.3-21.6)	28.4 (21.5-40.6)	723
Non-Hispanic blacks (2007 - 2008)	2.12 (1.89-2.38)	1.97 (1.64-2.26)	5.63 (4.15-6.94)	20.8 (12.9-23.9)	33.5 (26.3-47.6)	573
Non-Hispanic whites (1999 - 2000)	1.77 (1.23-2.53)	2.70 (.830-4.40)	11.0 (7.50-17.0)	38.0 (17.0-53.0)	48.0 (38.0-69.0)	595
Non-Hispanic whites (2001 - 2002)	*	.540 (<LOD-1.71)	4.21 (2.77-6.48)	18.8 (10.9-25.4)	33.1 (26.6-46.5)	1252
Non-Hispanic whites (2003 - 2004)	2.31 (2.00-2.66)	2.07 (1.73-2.41)	6.51 (5.12-7.85)	19.8 (15.4-23.3)	36.7 (27.4-47.8)	1061
Non-Hispanic whites (2005 - 2006)	1.94 (1.67-2.26)	1.76 (1.40-1.99)	5.33 (4.32-6.19)	13.6 (9.80-22.1)	28.9 (20.2-42.8)	1005
Non-Hispanic whites (2007 - 2008)	2.22 (1.83-2.69)	1.96 (1.57-2.48)	5.84 (4.70-7.68)	17.1 (12.4-24.3)	37.3 (25.9-48.7)	1088

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.18, 0.4, 0.5, 0.55, and 0.55 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethylthiophosphate (DMTP) (creatinine corrected) (1999 – 2008)

CAS Number 59401-04-6

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	1.64 (1.22-2.20)	2.12 (1.22-3.35)	9.57 (6.59-15.8)	32.0 (23.9-41.1)	51.0 (39.0-70.1)	1948
Total population (2001 - 2002)	*	.933 (<LOD-1.40)	4.08 (2.65-6.06)	14.6 (11.5-20.5)	28.9 (24.7-39.4)	3015
Total population (2003 - 2004)	2.21 (1.92-2.55)	1.98 (1.69-2.38)	5.96 (5.07-7.16)	19.1 (14.8-22.4)	32.6 (25.8-41.9)	2491
Total population (2005 - 2006)	1.99 (1.76-2.26)	1.75 (1.56-1.90)	5.00 (4.16-6.24)	16.8 (11.8-22.1)	30.0 (24.1-38.3)	2630
Total population (2007 - 2008)	2.34 (2.05-2.66)	2.00 (1.77-2.31)	5.91 (4.88-7.09)	17.5 (13.9-23.2)	33.7 (25.7-45.9)	2589
Age 6-11 years (1999 - 2000)	2.95 (2.25-3.86)	5.32 (3.75-6.33)	19.1 (12.2-28.0)	47.0 (32.1-60.3)	66.1 (50.9-95.0)	471
Age 6-11 years (2001 - 2002)	*	2.16 (1.32-3.12)	10.6 (7.84-13.6)	28.7 (18.8-45.0)	48.1 (33.4-71.1)	575
Age 6-11 years (2003 - 2004)	3.40 (2.70-4.28)	3.41 (2.40-4.17)	7.91 (6.43-12.2)	25.2 (16.7-34.2)	36.1 (25.4-67.7)	310
Age 6-11 years (2005 - 2006)	3.35 (2.67-4.21)	2.78 (2.03-3.66)	9.26 (5.67-15.1)	33.4 (16.8-54.3)	71.5 (28.7-161)	349
Age 6-11 years (2007 - 2008)	4.35 (3.78-5.01)	4.26 (3.36-4.75)	14.1 (9.35-16.6)	32.8 (23.8-45.4)	51.3 (41.1-77.9)	385
Age 12-19 years (1999 - 2000)	1.71 (1.07-2.75)	2.14 (.890-4.83)	13.5 (6.46-22.6)	36.0 (25.6-51.4)	61.5 (41.7-109)	664
Age 12-19 years (2001 - 2002)	*	.933 (<LOD-1.57)	3.56 (2.38-5.57)	12.2 (8.96-16.0)	22.5 (13.2-34.7)	821
Age 12-19 years (2003 - 2004)	1.66 (1.37-2.03)	1.52 (1.19-1.82)	4.38 (3.29-5.66)	13.3 (9.94-20.5)	26.5 (15.5-36.0)	715
Age 12-19 years (2005 - 2006)	1.89 (1.54-2.33)	1.81 (1.38-2.33)	4.55 (3.47-6.17)	14.3 (8.75-27.5)	32.9 (14.3-51.4)	717
Age 12-19 years (2007 - 2008)	1.62 (1.27-2.06)	1.46 (1.19-1.74)	4.14 (3.12-5.52)	11.1 (5.52-20.5)	20.5 (9.61-32.2)	389
Age 20-59 years (1999 - 2000)	1.47 (1.07-2.02)	1.90 (.870-3.11)	8.09 (5.19-14.6)	27.0 (19.8-37.6)	47.5 (34.2-70.1)	813
Age 20-59 years (2001 - 2002)	*	< LOD	3.16 (1.99-4.62)	11.9 (7.79-17.2)	25.2 (15.9-37.0)	1121
Age 20-59 years (2003 - 2004)	1.88 (1.61-2.19)	1.67 (1.45-1.94)	4.88 (4.20-5.68)	13.9 (10.3-19.7)	30.3 (19.7-38.2)	937
Age 20-59 years (2005 - 2006)	1.72 (1.52-1.96)	1.46 (1.28-1.65)	4.18 (3.14-4.99)	13.2 (9.30-21.9)	25.4 (21.4-30.3)	1091
Age 20-59 years (2007 - 2008)	2.02 (1.73-2.36)	1.79 (1.52-2.05)	4.53 (3.90-5.90)	13.2 (9.47-17.2)	26.7 (17.1-41.8)	1179
Age 60+ years (2001 - 2002)	*	1.39 (<LOD-2.40)	6.38 (3.68-9.97)	24.0 (14.9-35.2)	45.5 (26.5-69.7)	498
Age 60+ years (2003 - 2004)	3.86 (2.99-4.97)	3.18 (2.46-4.84)	11.2 (7.10-18.6)	29.2 (18.6-47.9)	48.2 (24.9-113)	529
Age 60+ years (2005 - 2006)	2.61 (2.12-3.20)	2.40 (1.75-2.75)	7.66 (5.71-11.3)	19.2 (12.1-31.1)	35.3 (20.5-56.4)	473
Age 60+ years (2007 - 2008)	3.56 (2.79-4.55)	3.05 (2.31-4.13)	10.6 (6.86-14.8)	31.8 (17.7-50.2)	54.2 (34.1-87.5)	636
Males (1999 - 2000)	1.61 (1.11-2.34)	2.39 (1.27-3.51)	9.27 (6.00-16.9)	28.9 (19.0-40.4)	41.1 (34.9-52.9)	952
Males (2001 - 2002)	*	.778 (<LOD-1.14)	3.82 (2.65-4.98)	13.6 (10.0-17.8)	25.2 (17.2-37.6)	1420
Males (2003 - 2004)	1.88 (1.58-2.23)	1.76 (1.51-2.12)	4.87 (3.87-6.31)	14.4 (9.18-20.4)	25.7 (17.7-36.9)	1220
Males (2005 - 2006)	1.59 (1.37-1.86)	1.33 (1.14-1.57)	4.06 (2.85-5.27)	13.1 (8.56-20.5)	26.0 (17.2-34.2)	1243
Males (2007 - 2008)	1.93 (1.68-2.21)	1.62 (1.42-1.94)	4.36 (3.77-5.50)	14.2 (10.4-17.7)	25.9 (18.2-39.7)	1292
Females (1999 - 2000)	1.66 (1.26-2.18)	2.01 (.870-3.33)	10.0 (6.67-16.2)	34.9 (26.2-47.1)	70.1 (39.0-118)	996
Females (2001 - 2002)	*	1.08 (<LOD-1.65)	4.44 (2.55-7.02)	17.4 (11.9-24.8)	38.0 (27.4-51.6)	1595
Females (2003 - 2004)	2.60 (2.23-3.02)	2.24 (1.83-2.63)	7.11 (5.54-10.2)	22.8 (18.9-28.7)	41.6 (29.2-58.9)	1271
Females (2005 - 2006)	2.47 (2.16-2.83)	2.19 (1.83-2.44)	6.07 (4.74-8.34)	20.7 (13.8-25.6)	36.7 (26.1-46.2)	1387
Females (2007 - 2008)	2.81 (2.40-3.29)	2.50 (2.07-2.93)	7.40 (5.83-8.83)	21.9 (16.7-27.4)	41.2 (27.4-60.8)	1297

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethylthiophosphate (DMTP) (creatinine corrected) (1999 – 2008)

CAS Number 59401-04-6

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	1.60 (.899-2.86)	1.83 (.680-4.23)	10.4 (5.95-16.9)	37.0 (23.1-63.1)	112 (40.5-190)	671
Mexican Americans (2001 - 2002)	*	< LOD	3.55 (2.65-4.68)	13.8 (9.88-22.9)	30.4 (22.9-47.2)	763
Mexican Americans (2003 - 2004)	2.20 (1.65-2.94)	2.24 (1.70-3.00)	5.95 (4.14-8.68)	15.7 (10.7-20.1)	24.5 (18.9-36.9)	609
Mexican Americans (2005 - 2006)	2.24 (1.96-2.55)	2.14 (1.89-2.40)	5.19 (4.33-6.18)	14.7 (10.9-20.0)	28.4 (21.5-36.3)	693
Mexican Americans (2007 - 2008)	2.14 (1.92-2.38)	1.88 (1.61-2.22)	4.84 (4.08-6.48)	13.2 (10.0-18.6)	26.2 (18.6-34.1)	500
Non-Hispanic blacks (1999 - 2000)	1.45 (1.03-2.06)	1.75 (1.17-3.06)	8.48 (4.36-13.4)	25.5 (15.4-39.3)	54.4 (25.5-97.6)	509
Non-Hispanic blacks (2001 - 2002)	1.13 (.889-1.44)	1.00 (.693-1.23)	3.62 (2.29-5.41)	12.4 (9.17-17.5)	23.3 (17.4-43.1)	754
Non-Hispanic blacks (2003 - 2004)	1.46 (1.28-1.67)	1.22 (1.06-1.37)	3.90 (2.77-5.34)	12.7 (8.09-18.7)	26.0 (14.6-38.7)	630
Non-Hispanic blacks (2005 - 2006)	1.40 (1.14-1.71)	1.12 (.938-1.37)	3.58 (2.63-5.06)	12.0 (8.44-19.3)	25.6 (17.4-31.2)	722
Non-Hispanic blacks (2007 - 2008)	1.61 (1.45-1.80)	1.38 (1.22-1.61)	4.26 (3.41-5.20)	14.7 (10.7-18.8)	27.5 (20.9-37.4)	572
Non-Hispanic whites (1999 - 2000)	1.68 (1.16-2.43)	2.22 (.870-3.51)	9.40 (5.58-17.0)	33.3 (20.6-49.4)	52.9 (39.0-71.1)	595
Non-Hispanic whites (2001 - 2002)	*	.966 (<LOD-1.61)	4.22 (2.41-7.00)	15.9 (11.6-24.1)	33.1 (24.8-45.4)	1252
Non-Hispanic whites (2003 - 2004)	2.40 (2.05-2.81)	2.12 (1.75-2.53)	6.27 (5.10-8.10)	20.0 (15.3-25.7)	36.2 (25.7-52.7)	1060
Non-Hispanic whites (2005 - 2006)	2.09 (1.80-2.42)	1.78 (1.56-2.06)	5.14 (4.02-6.91)	16.8 (11.3-23.4)	30.0 (23.4-38.3)	1005
Non-Hispanic whites (2007 - 2008)	2.40 (1.99-2.90)	2.04 (1.67-2.57)	6.00 (4.64-7.49)	16.9 (13.0-25.3)	37.6 (23.1-54.2)	1088

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethyldithiophosphate (DEDTP) (1999 – 2008)

CAS Number 298-06-6

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	.090 (<LOD-.140)	.210 (.140-.290)	.470 (.380-.640)	.870 (.640-1.10)	1949
Total population (2001 - 2002)	*	< LOD	< LOD	.610 (.410-.780)	.890 (.710-1.32)	3013
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.290 (.160-.510)	2494
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2420
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2585
Age 6-11 years (1999 - 2000)	*	.090 (<LOD-.160)	.190 (.130-.280)	.430 (.300-.650)	.850 (.470-1.00)	471
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	.630 (.380-.870)	.940 (.690-1.42)	576
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.540 (<LOD-.650)	310
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	317
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	383
Age 12-19 years (1999 - 2000)	*	.080 (<LOD-.180)	.260 (.120-.350)	.640 (.420-.840)	.930 (.720-1.30)	664
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	.560 (.330-.730)	.820 (.610-.990)	822
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	.150 (<LOD-.350)	.450 (.370-.570)	717
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	660
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 20-59 years (1999 - 2000)	*	.090 (<LOD-.130)	.210 (.130-.290)	.450 (.360-.640)	.900 (.610-1.10)	814
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	.620 (.430-.760)	.830 (.700-1.32)	1118
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.220 (<LOD-.580)	938
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1006
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1176
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	.630 (.360-1.08)	1.11 (.610-1.41)	497
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	.150 (<LOD-.550)	529
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	437
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	636
Males (1999 - 2000)	*	.090 (<LOD-.150)	.220 (.140-.310)	.490 (.380-.680)	.870 (.680-1.10)	952
Males (2001 - 2002)	*	< LOD	< LOD	.600 (.380-.740)	.780 (.700-1.03)	1420
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	.390 (.160-.540)	1221
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1142
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1290
Females (1999 - 2000)	*	.090 (<LOD-.130)	.190 (.110-.310)	.460 (.320-.840)	.870 (.440-1.40)	997
Females (2001 - 2002)	*	< LOD	< LOD	.660 (.460-.880)	1.03 (.700-1.47)	1593
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	.230 (<LOD-.600)	1273
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1278
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1295

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.05, 0.1, 0.1, 0.39, and 0.39 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethyldithiophosphate (DEDTP) (1999 – 2008)

CAS Number 298-06-6

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.130 (.099-.171)	.100 (.050-.200)	.310 (.230-.390)	.650 (.530-.860)	1.10 (.860-1.60)	672
Mexican Americans (2001 - 2002)	*	< LOD	.200 (<LOD-.520)	.720 (.410-1.12)	1.12 (.700-1.58)	763
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.110 (<LOD-.680)	.680 (.180-1.15)	610
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	665
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	495
Non-Hispanic blacks (1999 - 2000)	.117 (.084-.162)	.090 (<LOD-.230)	.270 (.140-.410)	.560 (.400-.830)	.870 (.650-1.20)	509
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	.620 (.440-.800)	.810 (.670-.930)	754
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	.250 (.110-.540)	631
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	660
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	574
Non-Hispanic whites (1999 - 2000)	*	.080 (<LOD-.160)	.190 (.120-.290)	.450 (.310-.720)	.870 (.510-1.30)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	.610 (.350-.800)	.910 (.660-1.41)	1252
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.240 (.120-.540)	1061
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	917
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1087

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.05, 0.1, 0.1, 0.39, and 0.39 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethyldithiophosphate (DEDTP) (creatinine corrected) (1999 – 2008)

CAS Number 298-06-6

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	.070 (<LOD-.110)	.200 (.140-.290)	.550 (.390-.700)	.860 (.670-1.14)	1949
Total population (2001 - 2002)	*	< LOD	< LOD	.604 (.389-.783)	1.08 (.768-1.52)	3012
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.412 (.350-.507)	2491
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2419
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2583
Age 6-11 years (1999 - 2000)	*	.100 (<LOD-.140)	.190 (.150-.270)	.570 (.410-.760)	1.03 (.570-1.58)	471
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	.778 (.606-1.12)	1.36 (1.02-1.86)	576
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.475 (<LOD-.967)	310
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	317
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	383
Age 12-19 years (1999 - 2000)	*	.050 (<LOD-.080)	.170 (.100-.220)	.440 (.230-.730)	.730 (.380-1.09)	664
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	.359 (.250-.537)	.667 (.375-.987)	821
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	.226 (<LOD-.259)	.333 (.241-.600)	715
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	660
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	388
Age 20-59 years (1999 - 2000)	*	.080 (<LOD-.110)	.210 (.140-.310)	.550 (.360-.730)	.860 (.650-1.20)	814
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	.583 (.379-.740)	1.03 (.699-1.60)	1118
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.400 (<LOD-.537)	937
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1005
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1176
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	.833 (.368-1.28)	1.44 (.853-2.61)	497
Age 60+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	.438 (<LOD-.700)	529
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	437
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	636
Males (1999 - 2000)	*	.070 (<LOD-.110)	.190 (.140-.230)	.410 (.340-.500)	.720 (.520-.940)	952
Males (2001 - 2002)	*	< LOD	< LOD	.389 (.309-.658)	.768 (.637-1.01)	1420
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	.339 (.269-.412)	1220
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1142
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Females (1999 - 2000)	*	.090 (<LOD-.120)	.220 (.140-.360)	.670 (.410-.870)	.890 (.660-1.62)	997
Females (2001 - 2002)	*	< LOD	< LOD	.733 (.527-1.03)	1.27 (.868-2.37)	1592
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	.500 (<LOD-.604)	1271
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1277
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Diethyldithiophosphate (DEDTP) (creatinine corrected) (1999 – 2008)

CAS Number 298-06-6

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.116 (.084-.161)	.090 (.060-.170)	.300 (.190-.410)	.810 (.570-.990)	1.19 (.860-2.66)	672
Mexican Americans (2001 - 2002)	*	< LOD	.292 (<LOD-.444)	.845 (.487-1.24)	1.29 (.901-1.67)	763
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.318 (<LOD-.467)	.579 (.404-.940)	609
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	665
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	494
Non-Hispanic blacks (1999 - 2000)	.080 (.057-.111)	.070 (<LOD-.110)	.170 (.110-.280)	.450 (.300-.580)	.700 (.500-1.02)	509
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	.456 (.362-.593)	.769 (.541-1.07)	753
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	.269 (.196-.368)	630
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	659
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	573
Non-Hispanic whites (1999 - 2000)	*	.070 (<LOD-.120)	.200 (.140-.310)	.560 (.380-.730)	.880 (.600-1.38)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	.583 (.368-.868)	1.14 (.682-1.70)	1252
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.389 (.333-.523)	1060
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	917
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1087

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethyldithiophosphate (DMDTP) (1999 – 2008)

CAS Number 756-80-9

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	2.30 (1.30-3.90)	13.0 (5.00-17.0)	19.0 (17.0-38.0)	1949
Total population (2001 - 2002)	*	< LOD	.920 (.330-1.30)	2.61 (2.04-3.45)	5.96 (4.41-7.90)	3015
Total population (2003 - 2004)	*	< LOD	.700 (.570-.920)	2.54 (1.64-3.87)	5.74 (3.63-9.85)	2458
Total population (2005 - 2006)	*	< LOD	< LOD	1.96 (1.41-2.59)	3.87 (2.77-6.09)	2635
Total population (2007 - 2008)	*	< LOD	< LOD	2.37 (1.93-2.93)	5.60 (4.62-6.79)	2571
Age 6-11 years (1999 - 2000)	.691 (.425-1.12)	.740 (.080-1.80)	4.30 (2.40-8.60)	17.0 (6.90-37.0)	32.0 (17.0-44.0)	471
Age 6-11 years (2001 - 2002)	*	< LOD	1.30 (.750-2.11)	3.53 (2.20-4.50)	7.33 (4.32-9.74)	575
Age 6-11 years (2003 - 2004)	*	< LOD	.900 (.620-1.14)	2.94 (1.14-5.48)	5.48 (2.94-8.53)	306
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	1.84 (.540-3.35)	3.69 (2.67-9.95)	350
Age 6-11 years (2007 - 2008)	*	< LOD	.950 (<LOD-1.48)	3.80 (2.45-5.70)	6.66 (5.11-9.64)	379
Age 12-19 years (1999 - 2000)	*	< LOD	2.30 (1.40-4.50)	13.0 (5.40-20.0)	20.0 (17.0-38.0)	664
Age 12-19 years (2001 - 2002)	*	< LOD	.830 (.400-1.14)	2.52 (1.85-3.07)	4.63 (3.59-5.83)	821
Age 12-19 years (2003 - 2004)	*	< LOD	.580 (.350-.770)	1.46 (1.12-1.99)	2.67 (1.82-4.49)	699
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	2.78 (1.51-3.76)	5.98 (3.03-11.5)	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	1.45 (.810-2.03)	2.45 (1.65-3.93)	384
Age 20-59 years (1999 - 2000)	*	< LOD	2.10 (.840-3.60)	11.0 (4.00-17.0)	17.0 (7.70-50.0)	814
Age 20-59 years (2001 - 2002)	*	< LOD	.840 (<LOD-1.31)	2.32 (1.70-3.40)	4.90 (2.90-9.52)	1122
Age 20-59 years (2003 - 2004)	*	< LOD	.610 (.350-.800)	2.00 (1.36-3.63)	5.07 (3.62-8.62)	925
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	1.71 (.880-2.36)	3.60 (2.40-5.18)	1092
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	1.84 (1.34-2.32)	4.27 (2.84-6.79)	1172
Age 60+ years (2001 - 2002)	*	< LOD	1.02 (.540-1.37)	3.57 (2.58-5.96)	8.16 (5.04-16.1)	497
Age 60+ years (2003 - 2004)	*	< LOD	1.39 (.720-2.34)	4.09 (2.35-13.4)	13.4 (3.36-33.3)	528
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	2.13 (1.67-3.34)	5.12 (2.62-8.17)	475
Age 60+ years (2007 - 2008)	*	< LOD	1.03 (<LOD-1.99)	5.47 (4.31-6.33)	8.89 (6.33-12.2)	636
Males (1999 - 2000)	*	.110 (<LOD-.610)	2.30 (1.20-4.90)	16.0 (5.70-17.0)	19.0 (17.0-38.0)	952
Males (2001 - 2002)	*	< LOD	.890 (.370-1.28)	2.59 (1.88-3.41)	5.96 (4.47-7.86)	1420
Males (2003 - 2004)	*	< LOD	.680 (.360-1.01)	2.26 (1.14-4.45)	5.30 (3.20-10.2)	1209
Males (2005 - 2006)	*	< LOD	< LOD	1.96 (.980-3.04)	4.33 (2.42-7.65)	1246
Males (2007 - 2008)	*	< LOD	< LOD	2.38 (1.76-3.70)	5.70 (3.80-10.0)	1278
Females (1999 - 2000)	*	< LOD	2.20 (1.10-3.90)	11.0 (4.20-17.0)	20.0 (13.0-40.0)	997
Females (2001 - 2002)	*	< LOD	.960 (.250-1.37)	2.61 (1.96-3.68)	5.72 (3.79-9.87)	1595
Females (2003 - 2004)	*	< LOD	.730 (.590-.970)	2.83 (1.99-3.96)	6.15 (3.91-11.3)	1249
Females (2005 - 2006)	*	< LOD	< LOD	1.96 (1.49-2.59)	3.75 (2.90-4.60)	1389
Females (2007 - 2008)	*	< LOD	< LOD	2.34 (1.79-3.12)	5.54 (4.06-6.69)	1293

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.08, 0.1, 0.1, 0.51, and 0.51 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethyldithiophosphate (DMDTP) (1999 – 2008)

CAS Number 756-80-9

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	.250 (<LOD-.870)	1.90 (1.10-3.00)	5.80 (4.10-9.70)	12.0 (5.90-28.0)	672
Mexican Americans (2001 - 2002)	*	< LOD	1.08 (.780-1.38)	2.80 (2.19-3.54)	4.93 (3.73-7.42)	763
Mexican Americans (2003 - 2004)	*	< LOD	.730 (.360-1.21)	2.11 (1.38-3.15)	5.26 (2.31-6.94)	610
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	2.04 (1.62-2.96)	5.12 (2.98-10.7)	695
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	1.63 (1.18-2.12)	3.88 (2.12-6.07)	491
Non-Hispanic blacks (1999 - 2000)	*	.330 (<LOD-1.20)	3.20 (1.40-7.00)	14.0 (5.70-30.0)	19.0 (17.0-39.0)	509
Non-Hispanic blacks (2001 - 2002)	*	< LOD	.640 (<LOD-1.41)	1.96 (1.36-4.15)	4.42 (2.68-8.38)	755
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.590 (.310-.730)	1.77 (1.05-3.33)	4.77 (2.75-7.80)	604
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	2.15 (1.66-2.82)	5.45 (2.82-8.39)	723
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	2.04 (1.54-2.65)	4.27 (2.66-7.79)	568
Non-Hispanic whites (1999 - 2000)	*	< LOD	2.00 (.800-4.00)	13.0 (3.90-20.0)	20.0 (16.0-40.0)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	1.01 (.180-1.43)	2.74 (1.94-4.18)	6.72 (4.88-8.54)	1252
Non-Hispanic whites (2003 - 2004)	*	< LOD	.740 (.540-1.04)	2.66 (1.55-4.56)	5.89 (3.63-11.6)	1056
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	1.93 (1.23-2.65)	3.60 (2.71-5.51)	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	2.32 (1.75-3.28)	5.60 (4.46-6.88)	1087

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, and 07-08 are 0.08, 0.1, 0.1, 0.51, and 0.51 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethyldithiophosphate (DMDTP) (creatinine corrected) (1999 – 2008)

CAS Number 756-80-9

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	1.88 (.970-3.86)	10.1 (5.31-18.3)	21.7 (12.8-33.7)	1949
Total population (2001 - 2002)	*	< LOD	.717 (.389-1.12)	2.80 (2.21-3.96)	6.84 (4.96-8.09)	3014
Total population (2003 - 2004)	*	< LOD	.572 (.411-.772)	2.62 (1.72-4.12)	6.40 (3.85-9.75)	2455
Total population (2005 - 2006)	*	< LOD	< LOD	2.18 (1.64-3.00)	4.62 (3.23-7.12)	2634
Total population (2007 - 2008)	*	< LOD	< LOD	2.63 (2.17-3.08)	6.12 (4.15-8.24)	2569
Age 6-11 years (1999 - 2000)	.748 (.474-1.18)	.790 (.190-1.60)	4.07 (2.31-7.18)	16.2 (8.22-27.0)	30.8 (20.2-38.9)	471
Age 6-11 years (2001 - 2002)	*	< LOD	1.36 (.805-2.31)	4.10 (2.67-6.24)	6.98 (4.40-12.8)	575
Age 6-11 years (2003 - 2004)	*	< LOD	.962 (.584-1.57)	3.39 (2.29-6.15)	7.12 (4.48-7.55)	306
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	2.57 (1.39-4.14)	4.50 (3.17-9.35)	350
Age 6-11 years (2007 - 2008)	*	< LOD	1.50 (<LOD-1.95)	4.35 (3.05-6.59)	8.01 (4.75-12.9)	379
Age 12-19 years (1999 - 2000)	*	< LOD	1.52 (.620-3.47)	9.48 (4.04-16.8)	21.5 (9.48-42.3)	664
Age 12-19 years (2001 - 2002)	*	< LOD	.543 (.306-.773)	2.02 (1.49-2.40)	3.13 (2.51-4.67)	820
Age 12-19 years (2003 - 2004)	*	< LOD	.361 (.241-.584)	1.02 (.628-1.57)	2.46 (1.33-3.39)	697
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	2.05 (1.16-3.56)	4.27 (2.30-8.66)	718
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	1.16 (.782-1.85)	1.94 (1.39-3.79)	382
Age 20-59 years (1999 - 2000)	*	< LOD	1.71 (.850-3.56)	8.50 (4.00-19.1)	20.5 (8.57-40.7)	814
Age 20-59 years (2001 - 2002)	*	< LOD	.605 (<LOD-1.05)	2.56 (1.64-4.03)	6.33 (3.96-8.17)	1122
Age 20-59 years (2003 - 2004)	*	< LOD	.451 (.340-.583)	2.17 (1.10-3.64)	5.71 (2.47-10.1)	924
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	1.90 (1.44-2.57)	3.69 (2.37-7.07)	1091
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	1.99 (1.80-2.32)	4.15 (2.77-6.77)	1172
Age 60+ years (2001 - 2002)	*	< LOD	1.10 (.631-1.86)	4.89 (3.36-7.82)	13.4 (6.98-19.8)	497
Age 60+ years (2003 - 2004)	*	< LOD	1.55 (.765-2.48)	6.52 (2.73-13.3)	13.3 (5.44-23.0)	528
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	3.22 (2.25-4.54)	6.53 (3.70-10.4)	475
Age 60+ years (2007 - 2008)	*	< LOD	1.72 (<LOD-2.58)	5.92 (3.29-8.44)	10.3 (7.25-18.4)	636
Males (1999 - 2000)	*	.150 (<LOD-.370)	1.79 (.840-3.97)	11.0 (4.62-17.4)	18.1 (7.51-44.7)	952
Males (2001 - 2002)	*	< LOD	.628 (.333-.850)	2.39 (1.75-3.13)	5.37 (4.23-7.29)	1420
Males (2003 - 2004)	*	< LOD	.467 (.280-.743)	2.03 (.990-3.56)	5.38 (2.29-8.25)	1208
Males (2005 - 2006)	*	< LOD	< LOD	1.80 (1.14-3.17)	4.14 (2.18-7.15)	1246
Males (2007 - 2008)	*	< LOD	< LOD	1.89 (1.44-2.71)	4.92 (2.77-8.44)	1277
Females (1999 - 2000)	*	< LOD	2.06 (.940-4.00)	9.30 (4.96-25.5)	27.0 (9.66-47.5)	997
Females (2001 - 2002)	*	< LOD	.831 (.412-1.50)	3.35 (2.50-4.96)	7.81 (5.29-11.9)	1594
Females (2003 - 2004)	*	< LOD	.680 (.538-.887)	3.59 (2.41-5.18)	7.12 (4.13-13.1)	1247
Females (2005 - 2006)	*	< LOD	< LOD	2.40 (2.00-3.18)	5.25 (3.18-7.60)	1388
Females (2007 - 2008)	*	< LOD	< LOD	3.05 (2.44-4.00)	7.18 (4.22-11.1)	1292

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary Dimethyldithiophosphate (DMDTP) (creatinine corrected) (1999 – 2008)

CAS Number 756-80-9

Metabolite of Several Organophosphorus Insecticides

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	.270 (<LOD-.660)	1.35 (.860-2.53)	6.55 (3.83-11.8)	16.7 (6.25-38.8)	672
Mexican Americans (2001 - 2002)	*	< LOD	.833 (.589-1.15)	2.72 (2.05-3.32)	5.16 (3.69-7.83)	763
Mexican Americans (2003 - 2004)	*	< LOD	.651 (.318-1.09)	2.04 (1.10-3.74)	4.50 (2.17-5.88)	609
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	2.40 (1.29-4.00)	5.14 (3.45-10.5)	695
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	1.97 (1.50-2.77)	4.30 (2.77-6.92)	490
Non-Hispanic blacks (1999 - 2000)	*	.250 (<LOD-.700)	2.40 (.690-5.44)	9.41 (4.81-17.8)	17.9 (11.5-40.7)	509
Non-Hispanic blacks (2001 - 2002)	*	< LOD	.403 (<LOD-.847)	1.69 (.793-3.50)	3.50 (2.19-5.91)	754
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.343 (.242-.477)	1.07 (.727-1.84)	3.21 (1.45-6.07)	603
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	1.80 (.990-3.89)	4.95 (2.93-5.59)	722
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	1.79 (1.38-2.31)	4.27 (2.44-6.16)	567
Non-Hispanic whites (1999 - 2000)	*	< LOD	1.77 (.780-4.02)	11.4 (4.07-21.5)	21.5 (11.4-34.8)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	.787 (.389-1.37)	3.42 (2.48-5.24)	7.75 (5.80-9.47)	1252
Non-Hispanic whites (2003 - 2004)	*	< LOD	.631 (.412-.897)	3.06 (1.75-5.84)	6.74 (4.42-12.0)	1055
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	2.16 (1.64-3.00)	4.14 (2.91-7.59)	1007
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	2.74 (2.12-3.58)	5.92 (4.00-9.71)	1087

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OP-DPM_BiomonitoringSummary.html

Urinary trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (trans-DCCA) (1999 – 2010)

CAS Number 55701-05-8

Metabolite of Cyfluthrin, trans-Cypermethrin, and trans-Permethrin

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	.560 (.480-.700)	1.40 (1.17-1.77)	3.42 (2.39-5.56)	1976
Total population (2001 - 2002)	*	< LOD	.430 (<LOD-.560)	1.18 (.930-1.64)	2.60 (1.85-3.58)	3033
Total population (2007 - 2008)	*	< LOD	< LOD	2.23 (1.58-3.30)	5.23 (3.87-7.05)	2576
Total population (2009 - 2010)	*	< LOD	< LOD	1.29 (.810-1.70)	5.42 (3.26-6.80)	2747
Age 6-11 years (1999 - 2000)	*	< LOD	.970 (.700-1.66)	2.91 (1.76-4.19)	4.19 (2.97-11.7)	478
Age 6-11 years (2001 - 2002)	*	< LOD	.470 (<LOD-.760)	1.39 (1.03-1.68)	2.50 (1.55-3.54)	576
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	1.50 (.740-3.01)	4.01 (1.81-10.4)	384
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	2.27 (<LOD-5.65)	8.64 (2.27-26.8)	386
Age 12-19 years (1999 - 2000)	*	< LOD	.710 (.520-.860)	2.07 (1.25-3.42)	4.28 (2.12-6.23)	675
Age 12-19 years (2001 - 2002)	*	< LOD	.490 (<LOD-.670)	1.20 (.800-1.60)	2.01 (1.49-3.77)	826
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	2.30 (1.13-3.73)	5.08 (2.36-7.61)	388
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	1.78 (1.05-2.50)	401
Age 20-59 years (1999 - 2000)	*	< LOD	.500 (.400-.620)	1.17 (.910-1.68)	2.94 (1.49-5.56)	823
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	1.17 (.850-1.85)	2.56 (1.64-4.66)	1123
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	2.15 (1.38-3.55)	5.36 (3.51-7.28)	1174
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	1.13 (<LOD-1.83)	5.88 (3.24-7.71)	1309
Age 60+ years (2001 - 2002)	*	< LOD	.460 (<LOD-.630)	1.13 (.760-2.44)	4.27 (1.20-6.49)	508
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	2.33 (.850-4.26)	4.87 (2.75-9.01)	630
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	1.66 (1.02-2.68)	6.09 (3.05-10.4)	651
Males (1999 - 2000)	*	< LOD	.560 (.500-.670)	1.28 (1.11-1.63)	2.25 (1.55-5.10)	961
Males (2001 - 2002)	*	< LOD	.420 (<LOD-.500)	1.12 (.860-1.58)	2.44 (1.69-3.70)	1419
Males (2007 - 2008)	*	< LOD	< LOD	2.20 (1.20-3.76)	5.29 (3.12-7.61)	1289
Males (2009 - 2010)	*	< LOD	< LOD	1.12 (<LOD-1.83)	4.98 (2.88-7.03)	1343
Females (1999 - 2000)	*	< LOD	.550 (.410-.820)	1.77 (1.07-3.08)	4.19 (3.08-6.81)	1015
Females (2001 - 2002)	*	< LOD	.440 (<LOD-.630)	1.23 (.910-1.98)	2.62 (1.90-3.58)	1614
Females (2007 - 2008)	*	< LOD	< LOD	2.27 (1.49-3.51)	5.08 (3.55-6.48)	1287
Females (2009 - 2010)	*	< LOD	< LOD	1.33 (<LOD-2.12)	5.51 (2.87-9.82)	1404

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 07-08, and 09-10 are 0.4, 0.4, 0.6, and 0.6 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cyfluthrin_Cypermethrin_Permethrin_BiomonitoringSummary.html

Urinary trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (trans-DCCA) (1999 – 2010)

CAS Number 55701-05-8

Metabolite of Cyfluthrin, trans-Cypermethrin, and trans-Permethrin

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	.470 (.410-.530)	1.23 (.830-1.60)	1.87 (1.49-3.35)	691
Mexican Americans (2001 - 2002)	*	< LOD	.410 (<LOD-.510)	.860 (.680-1.14)	1.57 (1.08-2.01)	767
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	1.37 (<LOD-1.99)	2.89 (1.63-4.19)	495
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	2.32 (1.06-3.76)	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	.780 (.490-1.13)	1.84 (1.08-4.69)	4.69 (1.41-14.5)	518
Non-Hispanic blacks (2001 - 2002)	*	< LOD	.590 (.490-.740)	1.26 (1.05-1.70)	2.25 (1.54-3.32)	764
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	2.24 (1.26-3.30)	4.25 (3.38-8.10)	569
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	1.78 (<LOD-4.06)	5.14 (2.59-8.69)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	.560 (.460-.730)	1.41 (1.14-2.14)	3.89 (2.14-6.43)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	.410 (<LOD-.580)	1.18 (.850-1.85)	2.64 (1.85-4.27)	1278
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	2.24 (1.38-3.76)	5.23 (3.96-6.48)	1082
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	1.29 (.690-1.88)	6.13 (3.24-9.30)	1200

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 07-08, and 09-10 are 0.4, 0.4, 0.6, and 0.6 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cyfluthrin_Cypermethrin_Permethrin_BiomonitoringSummary.html

Urinary trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (trans-DCCA) (creatinine corrected) (1999 – 2010)

CAS Number 55701-05-8

Metabolite of Cyfluthrin, trans-Cypermethrin, and trans-Permethrin

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	.700 (.609-.778)	1.56 (1.33-1.87)	2.65 (2.15-3.89)	1976
Total population (2001 - 2002)	*	< LOD	.737 (<LOD-.796)	1.47 (1.32-1.87)	2.62 (2.31-3.11)	3031
Total population (2007 - 2008)	*	< LOD	< LOD	2.90 (2.21-3.81)	5.15 (4.20-6.40)	2574
Total population (2009 - 2010)	*	< LOD	< LOD	2.10 (1.91-2.47)	4.37 (3.73-5.83)	2747
Age 6-11 years (1999 - 2000)	*	< LOD	1.31 (.718-1.74)	2.37 (1.56-5.07)	5.60 (1.91-11.3)	478
Age 6-11 years (2001 - 2002)	*	< LOD	.903 (<LOD-1.13)	2.16 (1.40-2.61)	2.87 (2.34-3.44)	576
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	2.46 (2.07-3.46)	4.18 (2.47-9.69)	384
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	2.61 (<LOD-5.87)	6.85 (2.61-38.8)	386
Age 12-19 years (1999 - 2000)	*	< LOD	.525 (.438-.727)	1.42 (.824-2.19)	2.19 (1.34-4.31)	675
Age 12-19 years (2001 - 2002)	*	< LOD	.528 (<LOD-.657)	.966 (.800-1.29)	1.57 (1.07-2.60)	825
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	2.06 (1.16-4.97)	5.51 (2.06-7.15)	386
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	1.83 (1.25-2.75)	401
Age 20-59 years (1999 - 2000)	*	< LOD	.700 (.571-.769)	1.33 (1.12-1.87)	2.39 (1.87-3.36)	823
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	1.47 (1.22-2.00)	2.55 (2.07-3.11)	1123
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	2.87 (2.15-3.82)	5.09 (3.83-6.81)	1174
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	2.10 (<LOD-2.63)	4.37 (3.63-6.16)	1309
Age 60+ years (2001 - 2002)	*	< LOD	.826 (<LOD-.933)	2.00 (1.22-2.80)	3.47 (2.15-6.57)	507
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	3.50 (2.21-4.83)	5.85 (3.65-8.56)	630
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	2.56 (2.00-3.72)	6.04 (3.82-13.7)	651
Males (1999 - 2000)	*	< LOD	.562 (.484-.667)	1.26 (1.07-1.42)	2.15 (1.47-2.74)	961
Males (2001 - 2002)	*	< LOD	.529 (<LOD-.583)	1.09 (.966-1.35)	2.25 (1.57-2.57)	1419
Males (2007 - 2008)	*	< LOD	< LOD	2.10 (1.36-3.47)	4.85 (3.20-5.95)	1288
Males (2009 - 2010)	*	< LOD	< LOD	1.86 (<LOD-2.25)	3.98 (2.63-6.04)	1343
Females (1999 - 2000)	*	< LOD	.875 (.718-1.11)	1.91 (1.48-2.39)	3.67 (2.30-6.28)	1015
Females (2001 - 2002)	*	< LOD	.903 (<LOD-1.00)	1.90 (1.56-2.15)	3.03 (2.55-3.20)	1612
Females (2007 - 2008)	*	< LOD	< LOD	3.50 (2.37-4.69)	6.23 (4.20-9.69)	1286
Females (2009 - 2010)	*	< LOD	< LOD	2.48 (<LOD-2.95)	5.30 (3.54-8.27)	1404

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cyfluthrin_Cypermethrin_Permethrin_BiomonitoringSummary.html

Urinary trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (trans-DCCA) (creatinine corrected) (1999 – 2010)

CAS Number 55701-05-8

Metabolite of Cyfluthrin, trans-Cypermethrin, and trans-Permethrin

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	.583 (.500-.745)	1.35 (1.02-1.65)	2.00 (1.56-2.80)	691
Mexican Americans (2001 - 2002)	*	< LOD	.573 (<LOD-.651)	1.08 (.909-1.22)	1.87 (1.39-2.15)	767
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	1.87 (<LOD-2.94)	3.20 (2.07-4.16)	494
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	2.57 (2.02-3.50)	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	.571 (.467-.739)	1.70 (.853-3.13)	3.36 (1.87-8.91)	518
Non-Hispanic blacks (2001 - 2002)	*	< LOD	.490 (.433-.571)	1.17 (.848-1.56)	2.37 (1.40-2.89)	763
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	2.00 (1.56-2.63)	4.85 (2.31-8.30)	568
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	1.75 (<LOD-2.25)	3.50 (2.13-6.13)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	.757 (.695-.848)	1.64 (1.33-2.00)	3.31 (2.00-5.60)	595
Non-Hispanic whites (2001 - 2002)	*	< LOD	.778 (<LOD-.848)	1.56 (1.34-2.00)	2.63 (2.30-3.16)	1277
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	3.10 (2.21-4.20)	5.34 (4.46-7.21)	1082
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	2.46 (1.91-3.00)	4.91 (3.73-7.83)	1200

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cyfluthrin_Cypermethrin_Permethrin_BiomonitoringSummary.html

Urinary cis-3-(2,2-Dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid (cis-DBCA) (1999 – 2010)

CAS Number 55701-05-8

Metabolite of Deltamethrin

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1698
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3048
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2583
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2746
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	415
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	580
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	570
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	831
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	389
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	713
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1128
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1177
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1308
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	509
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	633
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	818
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1429
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1290
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	880
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1619
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1293
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1403
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	578
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	767
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	500
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	445
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	776
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	572
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	503
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	527
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1281
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1082
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1200

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 07-08, and 09-10 are 0.1, 0.1, 0.5, and 0.5 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Deltamethrin_BiomonitoringSummary.html

Urinary cis-3-(2,2-Dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid (cis-DBCA) (creatinine corrected) (1999 – 2010)

CAS Number 55701-05-8

Metabolite of Deltamethrin

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1698
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3046
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2581
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2746
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	415
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	580
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	384
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	570
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	830
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	387
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	713
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1128
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1177
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1308
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	508
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	633
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	818
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1429
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	880
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1617
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1292
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1403
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	578
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	767
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	499
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	445
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	775
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	571
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	503
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	527
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1280
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1082
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1200

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Deltamethrin_BiomonitoringSummary.html

Urinary 4-Fluoro-3-phenoxybenzoic acid (1999 – 2010)

CAS Number 77279-89-1

Metabolite of Cyfluthrin

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1949
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3048
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	.140 (<LOD-.210)	2588
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2747
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	473
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	580
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.120 (<LOD-.160)	385
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	662
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	831
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	814
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1128
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.170 (<LOD-.290)	1180
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1309
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	509
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	.120 (<LOD-.260)	633
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	.220 (<LOD-.720)	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	950
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1429
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	.160 (<LOD-.270)	1293
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	999
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1619
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1295
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1404
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	666
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	767
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	.160 (<LOD-.240)	500
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	517
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	776
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	.140 (<LOD-.250)	574
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	.250 (<LOD-1.02)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	594
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1281
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	.140 (<LOD-.210)	1084
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1200

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 07-08, and 09-10 are 0.2, 0.2, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cyfluthrin_BiomonitoringSummary.html

Urinary 4-Fluoro-3-phenoxybenzoic acid (creatinine corrected) (1999 – 2010)

CAS Number 77279-89-1

Metabolite of Cyfluthrin

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1949
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	3046
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	.350 (<LOD-.412)	2586
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2747
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	473
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	580
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.374 (<LOD-.412)	385
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	386
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	662
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	830
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	388
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	401
Age 20-59 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	814
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1128
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.368 (<LOD-.467)	1180
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1309
Age 60+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	508
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	.389 (<LOD-.476)	633
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	.467 (<LOD-.700)	651
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	950
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1429
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	.233 (<LOD-.280)	1292
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1343
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	999
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1617
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1404
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	666
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	767
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	.333 (<LOD-.414)	499
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	602
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	517
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	775
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	.235 (<LOD-.292)	573
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	.333 (<LOD-.788)	504
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	594
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1280
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	.368 (<LOD-.438)	1084
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1200

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cyfluthrin_BiomonitoringSummary.html

Urinary 3-Phenoxybenzoic acid (1999 – 2010)

CAS Number 3739-38-6

Metabolite of Cypermethrin, Deltamethrin, and Permethrin

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.292 (.247-.345)	.250 (.190-.320)	.730 (.590-.850)	1.75 (1.49-2.16)	4.33 (2.62-6.30)	1998
Total population (2001 - 2002)	.318 (.275-.368)	.270 (.220-.340)	.700 (.570-.810)	1.73 (1.49-2.16)	3.54 (2.69-5.25)	3048
Total population (2007 - 2008)	.401 (.350-.460)	.390 (.340-.450)	1.10 (.870-1.39)	3.22 (2.55-4.19)	6.63 (4.99-8.24)	2454
Total population (2009 - 2010)	.418 (.389-.449)	.400 (.350-.460)	1.06 (.970-1.19)	3.12 (2.69-3.77)	6.50 (5.57-8.04)	2723
Age 6-11 years (1999 - 2000)	.417 (.292-.595)	.320 (.210-.490)	1.12 (.700-1.60)	4.18 (2.02-6.54)	8.63 (3.89-71.1)	483
Age 6-11 years (2001 - 2002)	.325 (.260-.406)	.300 (.200-.420)	.760 (.570-1.05)	1.81 (1.42-2.78)	3.38 (2.25-4.12)	580
Age 6-11 years (2007 - 2008)	.397 (.339-.464)	.360 (.280-.410)	1.13 (.780-1.55)	3.40 (2.19-5.87)	9.88 (3.40-17.3)	371
Age 6-11 years (2009 - 2010)	.549 (.389-.774)	.480 (.350-.700)	1.43 (1.00-2.15)	4.43 (2.80-8.04)	8.51 (4.12-39.4)	383
Age 12-19 years (1999 - 2000)	.336 (.265-.427)	.290 (.200-.440)	.870 (.620-1.04)	1.93 (1.49-2.90)	4.33 (1.83-11.1)	682
Age 12-19 years (2001 - 2002)	.353 (.288-.434)	.300 (.250-.390)	.800 (.560-1.13)	1.86 (1.48-2.35)	3.45 (2.14-6.69)	831
Age 12-19 years (2007 - 2008)	.393 (.273-.565)	.360 (.200-.640)	1.15 (.720-1.83)	2.96 (2.11-6.73)	7.42 (2.96-12.1)	361
Age 12-19 years (2009 - 2010)	.403 (.346-.470)	.410 (.310-.510)	.970 (.810-1.29)	2.25 (1.80-3.19)	3.92 (2.55-5.85)	398
Age 20-59 years (1999 - 2000)	.267 (.227-.314)	.230 (.160-.300)	.640 (.510-.820)	1.49 (1.25-1.78)	3.21 (2.04-5.41)	833
Age 20-59 years (2001 - 2002)	.314 (.271-.364)	.270 (.220-.340)	.670 (.530-.780)	1.65 (1.27-2.34)	3.25 (2.51-6.16)	1128
Age 20-59 years (2007 - 2008)	.427 (.376-.485)	.420 (.370-.470)	1.11 (.900-1.39)	3.38 (2.42-4.99)	6.65 (4.86-9.69)	1110
Age 20-59 years (2009 - 2010)	.416 (.382-.454)	.390 (.330-.470)	1.07 (.930-1.23)	3.50 (2.67-4.45)	6.95 (5.57-9.31)	1296
Age 60+ years (2001 - 2002)	.303 (.233-.394)	.250 (.180-.350)	.690 (.490-1.10)	2.03 (1.45-3.68)	5.16 (2.77-6.61)	509
Age 60+ years (2007 - 2008)	.335 (.270-.416)	.300 (.210-.470)	1.05 (.690-1.54)	2.68 (1.84-3.97)	4.70 (2.83-6.43)	612
Age 60+ years (2009 - 2010)	.382 (.343-.427)	.360 (.290-.450)	.980 (.860-1.17)	2.56 (2.07-2.88)	5.93 (3.21-8.95)	646
Males (1999 - 2000)	.273 (.226-.330)	.250 (.180-.330)	.710 (.570-.820)	1.49 (1.29-1.73)	2.41 (1.92-3.79)	974
Males (2001 - 2002)	.326 (.281-.379)	.300 (.230-.360)	.690 (.570-.750)	1.60 (1.37-2.15)	3.23 (2.56-5.25)	1429
Males (2007 - 2008)	.419 (.361-.487)	.430 (.370-.500)	1.11 (.830-1.48)	3.12 (2.15-4.58)	5.91 (4.19-7.56)	1215
Males (2009 - 2010)	.421 (.391-.454)	.400 (.340-.450)	1.07 (.900-1.29)	3.21 (2.51-4.45)	6.50 (5.51-9.07)	1331
Females (1999 - 2000)	.311 (.253-.384)	.250 (.190-.340)	.740 (.510-.990)	2.30 (1.63-3.36)	6.03 (3.27-11.8)	1024
Females (2001 - 2002)	.311 (.260-.371)	.250 (.200-.320)	.730 (.550-.920)	1.81 (1.53-2.47)	3.76 (2.51-6.55)	1619
Females (2007 - 2008)	.385 (.322-.462)	.360 (.290-.450)	1.07 (.820-1.42)	3.30 (2.32-5.30)	6.79 (5.15-9.69)	1239
Females (2009 - 2010)	.415 (.366-.471)	.400 (.350-.480)	1.06 (.910-1.26)	2.92 (2.51-3.84)	6.50 (4.89-8.50)	1392
Mexican Americans (1999 - 2000)	.260 (.230-.295)	.230 (.190-.270)	.600 (.430-.750)	1.35 (1.16-1.53)	2.18 (1.53-3.26)	697
Mexican Americans (2001 - 2002)	.290 (.233-.361)	.260 (.190-.350)	.650 (.490-.810)	1.26 (.860-2.17)	2.65 (1.50-3.44)	767
Mexican Americans (2007 - 2008)	.369 (.302-.451)	.400 (.280-.460)	.940 (.740-1.15)	2.27 (1.58-3.39)	3.62 (2.70-12.7)	476
Mexican Americans (2009 - 2010)	.371 (.316-.436)	.380 (.300-.480)	.830 (.750-1.02)	1.93 (1.55-2.53)	3.70 (2.53-4.81)	596
Non-Hispanic blacks (1999 - 2000)	.454 (.352-.586)	.450 (.350-.610)	1.13 (.750-1.46)	2.32 (1.45-5.35)	5.35 (2.32-21.1)	524
Non-Hispanic blacks (2001 - 2002)	.507 (.430-.599)	.520 (.440-.630)	.980 (.840-1.20)	2.03 (1.72-2.52)	3.86 (3.05-5.84)	776
Non-Hispanic blacks (2007 - 2008)	.420 (.353-.501)	.430 (.320-.540)	1.12 (.770-1.66)	3.11 (2.44-4.26)	6.13 (4.12-8.39)	533
Non-Hispanic blacks (2009 - 2010)	.464 (.349-.616)	.500 (.360-.650)	1.29 (.790-1.94)	2.86 (2.07-4.59)	5.86 (3.42-8.50)	499
Non-Hispanic whites (1999 - 2000)	.288 (.233-.355)	.240 (.160-.320)	.710 (.530-.850)	1.78 (1.41-3.05)	5.34 (2.62-8.43)	603
Non-Hispanic whites (2001 - 2002)	.297 (.248-.355)	.240 (.190-.320)	.600 (.490-.780)	1.75 (1.46-2.34)	3.70 (2.52-6.16)	1281
Non-Hispanic whites (2007 - 2008)	.394 (.329-.470)	.380 (.310-.450)	1.09 (.780-1.42)	3.38 (2.42-4.92)	6.53 (5.15-8.24)	1040
Non-Hispanic whites (2009 - 2010)	.412 (.384-.441)	.370 (.330-.420)	1.06 (.920-1.19)	3.83 (2.82-4.46)	8.08 (5.93-11.1)	1192

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 07-08, and 09-10 are 0.1, 0.1, 0.1, and 0.1 respectively.

Biomonitoring Summary:

https://www.cdc.gov/biomonitoring/Cyhalothrin_Cypermethrin_Deltamethrin_Fenprothrin_Permethrin_Tralomethrin_BiomonitoringSummary.html

Urinary 3-Phenoxybenzoic acid (creatinine corrected) (1999 – 2010)

CAS Number 3739-38-6

Metabolite of Cypermethrin, Deltamethrin, and Permethrin

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.261 (.224-.304)	.246 (.203-.280)	.550 (.459-.629)	1.40 (1.13-1.73)	3.19 (2.16-4.55)	1998
Total population (2001 - 2002)	.324 (.284-.371)	.290 (.247-.336)	.600 (.512-.743)	1.54 (1.26-1.91)	3.35 (2.50-4.92)	3046
Total population (2007 - 2008)	.426 (.374-.485)	.384 (.333-.450)	1.02 (.886-1.19)	3.08 (2.31-4.04)	5.83 (4.52-7.51)	2452
Total population (2009 - 2010)	.438 (.409-.469)	.384 (.342-.432)	1.01 (.898-1.13)	2.88 (2.50-3.19)	5.44 (4.52-6.38)	2723
Age 6-11 years (1999 - 2000)	.450 (.299-.677)	.371 (.241-.592)	1.13 (.733-1.62)	3.97 (1.75-8.07)	9.91 (2.43-64.0)	483
Age 6-11 years (2001 - 2002)	.423 (.335-.534)	.383 (.296-.500)	.864 (.594-1.35)	2.21 (1.61-2.95)	3.32 (2.64-5.40)	580
Age 6-11 years (2007 - 2008)	.511 (.431-.605)	.448 (.363-.545)	1.20 (.886-1.83)	3.81 (2.13-7.27)	9.86 (3.81-15.7)	371
Age 6-11 years (2009 - 2010)	.744 (.537-1.03)	.667 (.503-.838)	1.87 (1.30-2.60)	4.73 (2.88-9.57)	10.2 (4.48-51.9)	383
Age 12-19 years (1999 - 2000)	.227 (.178-.290)	.205 (.156-.269)	.486 (.379-.732)	1.37 (1.03-1.62)	2.52 (1.41-4.44)	682
Age 12-19 years (2001 - 2002)	.274 (.229-.328)	.236 (.189-.313)	.539 (.424-.730)	1.11 (.864-1.63)	2.35 (1.36-6.19)	830
Age 12-19 years (2007 - 2008)	.316 (.230-.434)	.281 (.191-.425)	.869 (.523-1.29)	3.13 (1.47-4.37)	5.41 (3.36-9.20)	359
Age 12-19 years (2009 - 2010)	.347 (.302-.399)	.301 (.256-.397)	.733 (.575-.903)	1.53 (1.33-2.46)	2.64 (1.76-3.75)	398
Age 20-59 years (1999 - 2000)	.246 (.216-.278)	.239 (.200-.272)	.505 (.405-.590)	1.11 (.861-1.49)	2.53 (1.73-4.09)	833
Age 20-59 years (2001 - 2002)	.311 (.271-.357)	.282 (.245-.328)	.552 (.444-.673)	1.44 (1.02-1.91)	3.22 (1.91-4.92)	1128
Age 20-59 years (2007 - 2008)	.443 (.384-.510)	.401 (.353-.472)	1.01 (.867-1.16)	2.95 (2.22-4.04)	6.29 (4.18-8.05)	1110
Age 20-59 years (2009 - 2010)	.419 (.389-.451)	.365 (.326-.421)	.993 (.826-1.10)	2.93 (2.35-3.62)	4.72 (4.17-6.15)	1296
Age 60+ years (2001 - 2002)	.372 (.301-.462)	.319 (.241-.406)	.785 (.541-1.05)	2.16 (1.30-3.50)	4.65 (2.63-6.15)	508
Age 60+ years (2007 - 2008)	.418 (.351-.498)	.363 (.288-.473)	1.06 (.832-1.59)	3.11 (2.22-4.43)	4.93 (3.37-7.62)	612
Age 60+ years (2009 - 2010)	.455 (.417-.496)	.397 (.342-.455)	1.06 (.875-1.30)	2.88 (2.37-3.61)	5.44 (3.77-8.53)	646
Males (1999 - 2000)	.210 (.173-.253)	.195 (.152-.254)	.513 (.388-.582)	1.09 (.841-1.41)	1.72 (1.49-2.52)	974
Males (2001 - 2002)	.269 (.233-.310)	.239 (.203-.280)	.500 (.429-.571)	1.27 (1.05-1.59)	2.95 (1.74-4.00)	1429
Males (2007 - 2008)	.359 (.314-.411)	.333 (.291-.392)	.840 (.722-1.00)	2.58 (1.58-3.57)	4.42 (3.40-6.46)	1214
Males (2009 - 2010)	.377 (.348-.409)	.323 (.295-.368)	.865 (.744-1.01)	2.48 (1.98-2.97)	4.72 (3.53-6.45)	1331
Females (1999 - 2000)	.323 (.270-.387)	.273 (.235-.333)	.608 (.477-.743)	1.94 (1.35-3.00)	5.04 (3.19-6.90)	1024
Females (2001 - 2002)	.388 (.331-.455)	.344 (.284-.408)	.737 (.563-.938)	1.84 (1.46-2.35)	4.43 (2.62-5.59)	1617
Females (2007 - 2008)	.500 (.416-.601)	.433 (.355-.540)	1.28 (.995-1.60)	3.56 (2.40-4.93)	7.20 (5.15-9.57)	1238
Females (2009 - 2010)	.505 (.453-.564)	.446 (.394-.500)	1.15 (1.00-1.33)	3.19 (2.54-3.73)	5.86 (4.58-8.90)	1392
Mexican Americans (1999 - 2000)	.234 (.202-.272)	.219 (.187-.234)	.475 (.368-.594)	1.04 (.700-1.39)	1.67 (1.06-3.00)	697
Mexican Americans (2001 - 2002)	.274 (.230-.328)	.242 (.206-.316)	.512 (.404-.654)	1.03 (.750-1.67)	1.83 (1.15-2.75)	767
Mexican Americans (2007 - 2008)	.386 (.320-.466)	.379 (.287-.488)	.911 (.692-1.24)	1.94 (1.47-2.38)	3.16 (2.08-9.55)	475
Mexican Americans (2009 - 2010)	.390 (.341-.446)	.355 (.305-.438)	.696 (.631-.774)	1.62 (1.40-2.15)	3.22 (2.19-3.89)	596
Non-Hispanic blacks (1999 - 2000)	.309 (.238-.401)	.268 (.224-.353)	.636 (.456-.935)	1.49 (1.05-3.43)	3.86 (1.51-7.25)	524
Non-Hispanic blacks (2001 - 2002)	.374 (.308-.455)	.357 (.290-.430)	.675 (.561-.817)	1.44 (1.20-2.31)	2.91 (2.03-3.76)	775
Non-Hispanic blacks (2007 - 2008)	.335 (.287-.391)	.320 (.269-.375)	.748 (.621-1.03)	2.30 (1.68-3.35)	4.62 (3.21-6.54)	532
Non-Hispanic blacks (2009 - 2010)	.352 (.281-.442)	.360 (.289-.436)	.865 (.587-1.21)	1.93 (1.48-2.59)	4.03 (2.43-4.91)	499
Non-Hispanic whites (1999 - 2000)	.272 (.225-.329)	.250 (.200-.292)	.552 (.443-.667)	1.55 (1.09-2.27)	4.02 (2.07-5.49)	603
Non-Hispanic whites (2001 - 2002)	.321 (.274-.377)	.281 (.238-.333)	.586 (.468-.811)	1.59 (1.26-2.19)	3.57 (2.25-5.59)	1280
Non-Hispanic whites (2007 - 2008)	.438 (.369-.519)	.368 (.304-.488)	1.00 (.849-1.23)	3.41 (2.41-4.37)	6.29 (4.52-8.37)	1040
Non-Hispanic whites (2009 - 2010)	.451 (.417-.488)	.388 (.328-.438)	1.07 (.889-1.25)	3.16 (2.63-3.71)	6.09 (4.69-9.08)	1192

Biomonitoring Summary:

https://www.cdc.gov/biomonitoring/Cyhalothrin_Cypermethrin_Deltamethrin_Fenpropathrin_Permethrin_Tralomethrin_BiomonitoringSummary.html

Urinary Antimony (1999 – 2010)

CAS Number 7440-36-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.132 (.120-.145)	.130 (.120-.150)	.220 (.200-.230)	.330 (.300-.350)	.430 (.390-.470)	2276
Total population (2001 - 2002)	.134 (.126-.142)	.130 (.130-.140)	.190 (.180-.200)	.270 (.250-.310)	.350 (.320-.400)	2690
Total population (2003 - 2004)	*	.080 (<LOD-.090)	.130 (.120-.150)	.200 (.190-.220)	.280 (.250-.320)	2558
Total population (2005 - 2006)	.073 (.066-.081)	.070 (.070-.080)	.120 (.110-.140)	.220 (.180-.250)	.300 (.270-.360)	2576
Total population (2007 - 2008)	.061 (.057-.066)	.060 (.060-.060)	.100 (.090-.110)	.170 (.140-.200)	.240 (.220-.260)	2627
Total population (2009 - 2010)	.056 (.053-.059)	.050 (.050-.060)	.090 (.090-.100)	.170 (.140-.180)	.230 (.200-.280)	2847
Age 6-11 years (1999 - 2000)	.176 (.154-.200)	.190 (.160-.210)	.260 (.230-.280)	.350 (.300-.400)	.440 (.320-.600)	316
Age 6-11 years (2001 - 2002)	.146 (.134-.160)	.150 (.130-.160)	.200 (.180-.210)	.270 (.240-.330)	.340 (.280-.440)	368
Age 6-11 years (2003 - 2004)	.099 (.087-.114)	.100 (.070-.120)	.160 (.120-.200)	.240 (.190-.310)	.310 (.230-.330)	290
Age 6-11 years (2005 - 2006)	.075 (.063-.088)	.080 (.060-.090)	.110 (.090-.130)	.190 (.120-.260)	.240 (.170-.340)	355
Age 6-11 years (2007 - 2008)	.068 (.061-.077)	.070 (.060-.080)	.110 (.090-.130)	.170 (.150-.210)	.230 (.180-.280)	394
Age 6-11 years (2009 - 2010)	.069 (.061-.079)	.070 (.060-.080)	.120 (.100-.150)	.220 (.150-.260)	.260 (.230-.350)	378
Age 12-19 years (1999 - 2000)	.158 (.141-.178)	.170 (.150-.180)	.240 (.210-.270)	.350 (.290-.420)	.460 (.350-.510)	663
Age 12-19 years (2001 - 2002)	.169 (.156-.184)	.160 (.150-.180)	.240 (.220-.260)	.350 (.320-.410)	.460 (.400-.500)	762
Age 12-19 years (2003 - 2004)	.105 (.095-.115)	.100 (.090-.120)	.150 (.140-.160)	.230 (.200-.270)	.290 (.250-.370)	725
Age 12-19 years (2005 - 2006)	.092 (.083-.101)	.090 (.080-.100)	.140 (.130-.160)	.240 (.200-.270)	.280 (.250-.320)	701
Age 12-19 years (2007 - 2008)	.079 (.069-.091)	.080 (.070-.090)	.130 (.110-.140)	.210 (.150-.230)	.230 (.210-.340)	376
Age 12-19 years (2009 - 2010)	.063 (.056-.071)	.060 (.050-.070)	.100 (.090-.120)	.180 (.150-.210)	.270 (.180-.370)	451
Age 20+ years (1999 - 2000)	.123 (.112-.137)	.120 (.110-.130)	.200 (.180-.220)	.310 (.290-.350)	.430 (.390-.470)	1297
Age 20+ years (2001 - 2002)	.128 (.119-.136)	.130 (.120-.130)	.180 (.170-.190)	.250 (.220-.300)	.330 (.280-.390)	1560
Age 20+ years (2003 - 2004)	*	.070 (<LOD-.080)	.120 (.100-.140)	.190 (.170-.210)	.270 (.220-.320)	1543
Age 20+ years (2005 - 2006)	.070 (.064-.078)	.070 (.060-.080)	.120 (.110-.140)	.220 (.180-.270)	.320 (.260-.420)	1520
Age 20+ years (2007 - 2008)	.058 (.054-.062)	.060 (.050-.060)	.090 (.090-.100)	.160 (.130-.190)	.240 (.210-.270)	1857
Age 20+ years (2009 - 2010)	.054 (.051-.057)	.050 (.050-.050)	.090 (.080-.090)	.150 (.140-.180)	.220 (.190-.270)	2018
Males (1999 - 2000)	.143 (.131-.157)	.150 (.130-.160)	.240 (.220-.260)	.350 (.330-.390)	.470 (.390-.570)	1132
Males (2001 - 2002)	.145 (.136-.154)	.140 (.130-.150)	.200 (.190-.210)	.310 (.280-.330)	.390 (.350-.440)	1335
Males (2003 - 2004)	.095 (.088-.103)	.090 (.080-.100)	.140 (.130-.160)	.220 (.200-.250)	.320 (.270-.350)	1281
Males (2005 - 2006)	.085 (.076-.095)	.080 (.080-.090)	.140 (.120-.160)	.250 (.210-.290)	.350 (.260-.460)	1271
Males (2007 - 2008)	.068 (.062-.076)	.070 (.060-.070)	.110 (.100-.120)	.210 (.170-.230)	.280 (.230-.340)	1327
Males (2009 - 2010)	.060 (.055-.065)	.060 (.050-.070)	.100 (.090-.110)	.170 (.150-.200)	.250 (.200-.290)	1397
Females (1999 - 2000)	.122 (.109-.137)	.120 (.110-.140)	.200 (.180-.220)	.300 (.280-.340)	.400 (.350-.460)	1144
Females (2001 - 2002)	.125 (.117-.133)	.120 (.120-.130)	.180 (.160-.190)	.240 (.220-.280)	.320 (.260-.360)	1355
Females (2003 - 2004)	*	< LOD	.120 (.090-.140)	.180 (.150-.220)	.230 (.190-.330)	1277
Females (2005 - 2006)	.063 (.057-.071)	.060 (.050-.070)	.100 (.090-.120)	.180 (.150-.230)	.270 (.200-.330)	1305
Females (2007 - 2008)	.055 (.052-.058)	.050 (.050-.060)	.090 (.080-.100)	.130 (.120-.150)	.200 (.170-.230)	1300
Females (2009 - 2010)	.052 (.049-.056)	.050 (.040-.050)	.090 (.080-.090)	.150 (.130-.170)	.220 (.190-.270)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.04, 0.04, 0.07, 0.032, 0.032, and 0.032 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Antimony_BiomonitoringSummary.html

Urinary Antimony (1999 – 2010)

CAS Number 7440-36-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.132 (.108-.161)	.140 (.120-.170)	.210 (.180-.240)	.300 (.260-.390)	.430 (.330-.560)	787
Mexican Americans (2001 - 2002)	.142 (.130-.154)	.130 (.130-.150)	.200 (.170-.230)	.260 (.240-.320)	.360 (.300-.400)	683
Mexican Americans (2003 - 2004)	.093 (.079-.110)	.090 (<LOD-.120)	.140 (.120-.160)	.190 (.160-.260)	.270 (.210-.330)	618
Mexican Americans (2005 - 2006)	.093 (.082-.105)	.090 (.080-.100)	.150 (.140-.170)	.250 (.210-.340)	.470 (.270-.850)	652
Mexican Americans (2007 - 2008)	.069 (.060-.079)	.070 (.060-.080)	.110 (.100-.120)	.190 (.150-.250)	.270 (.220-.390)	515
Mexican Americans (2009 - 2010)	.063 (.060-.067)	.060 (.060-.070)	.110 (.090-.120)	.170 (.150-.200)	.250 (.200-.270)	613
Non-Hispanic blacks (1999 - 2000)	.175 (.148-.207)	.180 (.150-.200)	.260 (.230-.300)	.400 (.310-.490)	.490 (.410-.710)	554
Non-Hispanic blacks (2001 - 2002)	.180 (.164-.197)	.170 (.160-.190)	.250 (.220-.280)	.360 (.320-.410)	.460 (.370-.530)	667
Non-Hispanic blacks (2003 - 2004)	.108 (.098-.119)	.110 (.100-.120)	.160 (.150-.190)	.230 (.200-.280)	.310 (.250-.360)	723
Non-Hispanic blacks (2005 - 2006)	.088 (.077-.100)	.090 (.080-.100)	.140 (.130-.170)	.210 (.190-.250)	.280 (.240-.320)	692
Non-Hispanic blacks (2007 - 2008)	.085 (.079-.092)	.080 (.080-.090)	.130 (.120-.140)	.210 (.180-.250)	.290 (.250-.370)	589
Non-Hispanic blacks (2009 - 2010)	.073 (.065-.081)	.070 (.060-.080)	.120 (.110-.140)	.190 (.160-.250)	.280 (.220-.350)	544
Non-Hispanic whites (1999 - 2000)	.128 (.115-.144)	.130 (.110-.140)	.210 (.190-.230)	.330 (.280-.350)	.400 (.360-.500)	768
Non-Hispanic whites (2001 - 2002)	.126 (.117-.135)	.130 (.120-.130)	.180 (.170-.190)	.250 (.230-.300)	.340 (.310-.390)	1132
Non-Hispanic whites (2003 - 2004)	*	.070 (<LOD-.080)	.130 (.110-.140)	.190 (.170-.210)	.280 (.230-.320)	1074
Non-Hispanic whites (2005 - 2006)	.069 (.062-.077)	.070 (.060-.080)	.110 (.100-.130)	.210 (.170-.260)	.300 (.240-.380)	1041
Non-Hispanic whites (2007 - 2008)	.057 (.052-.063)	.060 (.050-.060)	.090 (.080-.110)	.150 (.130-.200)	.230 (.190-.260)	1095
Non-Hispanic whites (2009 - 2010)	.053 (.050-.057)	.050 (.040-.050)	.090 (.080-.090)	.160 (.130-.190)	.230 (.190-.280)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.04, 0.04, 0.07, 0.032, 0.032, and 0.032 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Antimony_BiomonitoringSummary.html

Urinary Antimony (2011 – 2016)

CAS Number 7440-36-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	.047 (.042-.052)	.083 (.075-.091)	.144 (.125-.158)	.188 (.169-.222)	2504
Total population (2013 - 2014)	.043 (.039-.048)	.041 (.036-.046)	.076 (.069-.086)	.130 (.120-.144)	.189 (.170-.214)	2664
Total population (2015 - 2016)	.047 (.044-.051)	.046 (.043-.051)	.080 (.077-.085)	.137 (.126-.150)	.201 (.171-.218)	3061
Age 3-5 years (2015 - 2016)	.049 (.044-.055)	.049 (.042-.054)	.087 (.075-.096)	.138 (.118-.164)	.188 (.152-.212)	486
Age 6-11 years (2011 - 2012)	.064 (.059-.069)	.059 (.049-.072)	.108 (.094-.124)	.169 (.152-.188)	.206 (.182-.257)	399
Age 6-11 years (2013 - 2014)	.052 (.045-.060)	.053 (.046-.065)	.096 (.089-.105)	.151 (.128-.172)	.228 (.168-.254)	402
Age 6-11 years (2015 - 2016)	.061 (.054-.068)	.063 (.054-.067)	.102 (.089-.115)	.159 (.134-.176)	.207 (.168-.244)	379
Age 12-19 years (2011 - 2012)	.065 (.057-.073)	.065 (.048-.081)	.106 (.098-.126)	.173 (.137-.202)	.218 (.166-.283)	390
Age 12-19 years (2013 - 2014)	.051 (.043-.061)	.051 (.041-.062)	.088 (.070-.112)	.138 (.121-.166)	.203 (.152-.235)	451
Age 12-19 years (2015 - 2016)	.059 (.051-.068)	.060 (.047-.069)	.094 (.080-.118)	.160 (.129-.207)	.259 (.178-.292)	402
Age 20+ years (2011 - 2012)	*	.044 (<LOD-.051)	.076 (.066-.087)	.129 (.112-.152)	.171 (.158-.228)	1715
Age 20+ years (2013 - 2014)	.042 (.038-.045)	.039 (.033-.043)	.071 (.065-.079)	.128 (.116-.137)	.184 (.161-.215)	1811
Age 20+ years (2015 - 2016)	.045 (.042-.047)	.044 (.040-.048)	.077 (.073-.080)	.131 (.113-.147)	.191 (.161-.209)	1794
Males (2011 - 2012)	.057 (.052-.063)	.052 (.044-.061)	.089 (.080-.100)	.152 (.124-.169)	.196 (.169-.259)	1262
Males (2013 - 2014)	.048 (.044-.052)	.046 (.041-.051)	.082 (.072-.094)	.145 (.129-.161)	.213 (.182-.230)	1318
Males (2015 - 2016)	.053 (.049-.058)	.053 (.047-.058)	.090 (.080-.103)	.156 (.137-.162)	.209 (.175-.248)	1524
Females (2011 - 2012)	*	.043 (<LOD-.049)	.074 (.068-.082)	.131 (.122-.149)	.182 (.166-.218)	1242
Females (2013 - 2014)	.040 (.036-.044)	.036 (.030-.043)	.070 (.062-.078)	.122 (.105-.132)	.169 (.146-.200)	1346
Females (2015 - 2016)	.042 (.039-.045)	.042 (.037-.045)	.072 (.067-.078)	.117 (.107-.131)	.178 (.150-.205)	1537
Mexican Americans (2011 - 2012)	.056 (.051-.062)	.053 (.044-.062)	.086 (.075-.091)	.134 (.110-.164)	.174 (.149-.261)	317
Mexican Americans (2013 - 2014)	.048 (.038-.060)	.047 (.033-.057)	.082 (.066-.106)	.172 (.109-.248)	.252 (.170-.432)	453
Mexican Americans (2015 - 2016)	.057 (.052-.062)	.057 (.053-.063)	.090 (.084-.098)	.139 (.121-.165)	.194 (.167-.284)	585
Non-Hispanic blacks (2011 - 2012)	.070 (.063-.079)	.068 (.062-.074)	.110 (.096-.125)	.182 (.148-.229)	.254 (.200-.354)	669
Non-Hispanic blacks (2013 - 2014)	.065 (.056-.075)	.066 (.060-.070)	.111 (.097-.128)	.189 (.146-.225)	.245 (.218-.303)	581
Non-Hispanic blacks (2015 - 2016)	.068 (.062-.075)	.066 (.057-.073)	.110 (.097-.127)	.192 (.166-.219)	.265 (.211-.319)	671
Non-Hispanic whites (2011 - 2012)	*	.044 (<LOD-.049)	.081 (.069-.095)	.143 (.118-.159)	.180 (.159-.231)	820
Non-Hispanic whites (2013 - 2014)	.041 (.037-.045)	.037 (.032-.043)	.071 (.063-.079)	.118 (.104-.130)	.167 (.143-.184)	985
Non-Hispanic whites (2015 - 2016)	.044 (.041-.047)	.043 (.039-.047)	.075 (.068-.081)	.129 (.112-.144)	.178 (.155-.208)	924
All Hispanics (2011 - 2012)	*	.046 (<LOD-.053)	.079 (.066-.088)	.128 (.110-.149)	.174 (.149-.208)	573
All Hispanics (2013 - 2014)	.047 (.040-.055)	.045 (.038-.052)	.079 (.069-.096)	.155 (.116-.218)	.231 (.178-.318)	701
All Hispanics (2015 - 2016)	.054 (.050-.058)	.053 (.048-.058)	.086 (.080-.094)	.136 (.117-.161)	.205 (.167-.264)	982
Asians (2011 - 2012)	*	< LOD	.066 (.054-.075)	.103 (.075-.145)	.145 (.100-.194)	353
Asians (2013 - 2014)	*	.027 (<LOD-.036)	.052 (.045-.061)	.080 (.065-.098)	.099 (.083-.169)	292
Asians (2015 - 2016)	.033 (.028-.038)	.030 (.022-.039)	.051 (.042-.061)	.092 (.062-.134)	.139 (.095-.208)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.041, 0.022, and 0.022, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Antimony_BiomonitoringSummary.html

Urinary Antimony (creatinine corrected) (1999 – 2010)

CAS Number 7440-36-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.124 (.108-.143)	.119 (.102-.143)	.185 (.164-.214)	.276 (.233-.333)	.385 (.333-.430)	2276
Total population (2001 - 2002)	.126 (.119-.134)	.120 (.115-.126)	.173 (.162-.188)	.267 (.242-.300)	.364 (.320-.414)	2689
Total population (2003 - 2004)	*	.080 (<LOD-.086)	.135 (.119-.143)	.208 (.192-.230)	.277 (.250-.294)	2558
Total population (2005 - 2006)	.072 (.068-.077)	.070 (.060-.070)	.100 (.100-.110)	.160 (.150-.190)	.230 (.190-.290)	2576
Total population (2007 - 2008)	.064 (.060-.068)	.060 (.060-.060)	.090 (.080-.100)	.140 (.140-.160)	.200 (.170-.230)	2627
Total population (2009 - 2010)	.060 (.056-.064)	.060 (.050-.060)	.090 (.080-.090)	.140 (.120-.160)	.200 (.180-.230)	2847
Age 6-11 years (1999 - 2000)	.191 (.147-.248)	.185 (.156-.220)	.250 (.200-.417)	.447 (.271-.741)	.741 (.333-1.30)	316
Age 6-11 years (2001 - 2002)	.178 (.159-.200)	.173 (.150-.193)	.228 (.200-.272)	.338 (.265-.480)	.471 (.313-.727)	368
Age 6-11 years (2003 - 2004)	.116 (.103-.130)	.118 (.098-.136)	.167 (.146-.187)	.256 (.194-.317)	.333 (.250-.500)	290
Age 6-11 years (2005 - 2006)	.092 (.081-.104)	.090 (.080-.110)	.130 (.110-.150)	.180 (.150-.210)	.220 (.180-.270)	355
Age 6-11 years (2007 - 2008)	.089 (.079-.100)	.090 (.070-.100)	.120 (.110-.140)	.200 (.150-.240)	.300 (.200-.370)	394
Age 6-11 years (2009 - 2010)	.094 (.084-.106)	.090 (.080-.100)	.140 (.120-.160)	.200 (.170-.250)	.280 (.220-.320)	378
Age 12-19 years (1999 - 2000)	.121 (.104-.140)	.120 (.095-.146)	.176 (.146-.207)	.259 (.206-.310)	.310 (.228-.421)	663
Age 12-19 years (2001 - 2002)	.121 (.112-.131)	.115 (.106-.127)	.160 (.138-.186)	.224 (.199-.245)	.266 (.244-.310)	762
Age 12-19 years (2003 - 2004)	.075 (.068-.082)	.068 (.061-.077)	.100 (.092-.113)	.156 (.126-.173)	.193 (.172-.255)	725
Age 12-19 years (2005 - 2006)	.070 (.065-.076)	.070 (.060-.080)	.100 (.090-.110)	.140 (.120-.150)	.170 (.150-.250)	701
Age 12-19 years (2007 - 2008)	.062 (.054-.070)	.060 (.050-.070)	.090 (.070-.100)	.120 (.100-.160)	.160 (.110-.240)	376
Age 12-19 years (2009 - 2010)	.059 (.053-.066)	.060 (.050-.060)	.090 (.070-.100)	.130 (.110-.170)	.180 (.150-.220)	451
Age 20+ years (1999 - 2000)	.118 (.104-.135)	.111 (.097-.135)	.175 (.149-.209)	.263 (.227-.320)	.352 (.320-.391)	1297
Age 20+ years (2001 - 2002)	.122 (.115-.129)	.115 (.108-.121)	.167 (.153-.181)	.265 (.241-.300)	.364 (.318-.405)	1559
Age 20+ years (2003 - 2004)	*	.079 (<LOD-.087)	.135 (.116-.145)	.209 (.195-.233)	.278 (.250-.294)	1543
Age 20+ years (2005 - 2006)	.070 (.066-.075)	.060 (.060-.070)	.100 (.090-.110)	.170 (.150-.190)	.250 (.190-.300)	1520
Age 20+ years (2007 - 2008)	.062 (.058-.066)	.060 (.050-.060)	.090 (.080-.100)	.140 (.130-.160)	.200 (.160-.240)	1857
Age 20+ years (2009 - 2010)	.057 (.053-.061)	.050 (.050-.060)	.080 (.080-.090)	.130 (.120-.140)	.190 (.160-.220)	2018
Males (1999 - 2000)	.112 (.099-.127)	.109 (.095-.127)	.164 (.146-.181)	.226 (.204-.268)	.320 (.235-.391)	1132
Males (2001 - 2002)	.114 (.107-.123)	.108 (.103-.115)	.153 (.138-.171)	.228 (.205-.250)	.333 (.281-.438)	1334
Males (2003 - 2004)	.080 (.076-.084)	.075 (.069-.081)	.122 (.111-.132)	.192 (.173-.209)	.253 (.230-.278)	1281
Males (2005 - 2006)	.070 (.064-.077)	.060 (.060-.070)	.100 (.090-.120)	.160 (.130-.220)	.250 (.170-.310)	1271
Males (2007 - 2008)	.061 (.057-.066)	.060 (.050-.060)	.090 (.080-.100)	.140 (.130-.160)	.210 (.160-.260)	1327
Males (2009 - 2010)	.055 (.050-.060)	.050 (.050-.060)	.080 (.070-.100)	.130 (.120-.150)	.190 (.160-.210)	1397
Females (1999 - 2000)	.137 (.117-.161)	.131 (.108-.164)	.213 (.176-.247)	.320 (.263-.417)	.429 (.357-.485)	1144
Females (2001 - 2002)	.139 (.131-.148)	.132 (.124-.140)	.196 (.178-.211)	.295 (.267-.317)	.371 (.333-.444)	1355
Females (2003 - 2004)	*	< LOD	.143 (.125-.161)	.225 (.188-.261)	.288 (.250-.333)	1277
Females (2005 - 2006)	.074 (.070-.078)	.070 (.070-.070)	.110 (.100-.110)	.170 (.150-.190)	.220 (.180-.300)	1305
Females (2007 - 2008)	.067 (.062-.071)	.060 (.060-.070)	.100 (.090-.100)	.140 (.130-.160)	.200 (.160-.230)	1300
Females (2009 - 2010)	.064 (.060-.069)	.060 (.060-.070)	.090 (.090-.100)	.150 (.130-.170)	.220 (.180-.260)	1450

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Antimony_BiomonitoringSummary.html

Urinary Antimony (creatinine corrected) (1999 – 2010)

CAS Number 7440-36-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.120 (.107-.135)	.114 (.105-.129)	.167 (.148-.203)	.250 (.209-.315)	.333 (.280-.357)	787
Mexican Americans (2001 - 2002)	.138 (.128-.149)	.130 (.117-.143)	.182 (.159-.203)	.269 (.229-.308)	.338 (.308-.429)	682
Mexican Americans (2003 - 2004)	.086 (.076-.098)	.082 (<LOD-.092)	.129 (.107-.151)	.189 (.154-.238)	.238 (.185-.321)	618
Mexican Americans (2005 - 2006)	.087 (.076-.099)	.080 (.070-.080)	.120 (.110-.130)	.190 (.150-.310)	.370 (.200-.800)	652
Mexican Americans (2007 - 2008)	.069 (.059-.081)	.060 (.050-.080)	.100 (.080-.120)	.160 (.130-.180)	.200 (.160-.360)	515
Mexican Americans (2009 - 2010)	.066 (.063-.071)	.060 (.060-.060)	.100 (.080-.110)	.160 (.130-.190)	.240 (.190-.280)	613
Non-Hispanic blacks (1999 - 2000)	.114 (.099-.133)	.112 (.098-.130)	.163 (.144-.183)	.236 (.195-.338)	.343 (.255-.425)	554
Non-Hispanic blacks (2001 - 2002)	.123 (.113-.134)	.115 (.106-.127)	.163 (.150-.181)	.233 (.208-.267)	.300 (.248-.373)	667
Non-Hispanic blacks (2003 - 2004)	.078 (.071-.085)	.074 (.069-.082)	.109 (.096-.124)	.170 (.148-.192)	.222 (.179-.257)	723
Non-Hispanic blacks (2005 - 2006)	.064 (.058-.071)	.060 (.050-.070)	.090 (.080-.090)	.130 (.120-.150)	.190 (.150-.220)	692
Non-Hispanic blacks (2007 - 2008)	.062 (.059-.066)	.060 (.050-.070)	.090 (.080-.090)	.140 (.120-.160)	.180 (.160-.220)	589
Non-Hispanic blacks (2009 - 2010)	.058 (.053-.063)	.060 (.050-.060)	.080 (.070-.090)	.130 (.110-.160)	.170 (.150-.190)	544
Non-Hispanic whites (1999 - 2000)	.129 (.109-.152)	.125 (.102-.152)	.195 (.167-.225)	.298 (.239-.352)	.400 (.333-.444)	768
Non-Hispanic whites (2001 - 2002)	.127 (.117-.138)	.120 (.113-.130)	.176 (.159-.198)	.280 (.241-.317)	.380 (.318-.471)	1132
Non-Hispanic whites (2003 - 2004)	*	.081 (<LOD-.089)	.139 (.124-.147)	.217 (.200-.238)	.286 (.253-.333)	1074
Non-Hispanic whites (2005 - 2006)	.072 (.068-.077)	.070 (.060-.070)	.110 (.100-.110)	.170 (.150-.190)	.230 (.190-.280)	1041
Non-Hispanic whites (2007 - 2008)	.064 (.060-.069)	.060 (.050-.070)	.090 (.080-.100)	.140 (.140-.160)	.210 (.170-.230)	1095
Non-Hispanic whites (2009 - 2010)	.060 (.055-.065)	.060 (.050-.060)	.090 (.080-.100)	.140 (.120-.170)	.200 (.170-.250)	1225

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Antimony_BiomonitoringSummary.html

Urinary Antimony (creatinine corrected) (2011 – 2016)

CAS Number 7440-36-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	.059 (.055-.063)	.092 (.085-.100)	.152 (.135-.171)	.223 (.181-.261)	2502
Total population (2013 - 2014)	.050 (.046-.055)	.047 (.044-.051)	.073 (.068-.079)	.114 (.103-.127)	.160 (.145-.172)	2663
Total population (2015 - 2016)	.053 (.050-.056)	.049 (.047-.052)	.079 (.071-.087)	.124 (.115-.137)	.176 (.152-.190)	3058
Age 3-5 years (2015 - 2016)	.113 (.103-.124)	.108 (.097-.117)	.163 (.149-.181)	.255 (.220-.291)	.328 (.274-.425)	485
Age 6-11 years (2011 - 2012)	.091 (.081-.102)	.091 (.078-.100)	.130 (.116-.147)	.206 (.153-.283)	.308 (.218-.340)	398
Age 6-11 years (2013 - 2014)	.077 (.068-.088)	.076 (.067-.084)	.114 (.098-.133)	.177 (.154-.193)	.225 (.191-.238)	402
Age 6-11 years (2015 - 2016)	.086 (.077-.096)	.084 (.073-.096)	.125 (.114-.137)	.183 (.155-.210)	.250 (.196-.300)	379
Age 12-19 years (2011 - 2012)	.062 (.055-.069)	.058 (.051-.067)	.085 (.070-.106)	.147 (.115-.181)	.222 (.122-.373)	390
Age 12-19 years (2013 - 2014)	.046 (.041-.053)	.047 (.039-.052)	.064 (.057-.071)	.103 (.084-.115)	.144 (.109-.172)	451
Age 12-19 years (2015 - 2016)	.055 (.049-.062)	.050 (.045-.059)	.075 (.065-.085)	.114 (.096-.133)	.148 (.128-.200)	402
Age 20+ years (2011 - 2012)	*	.056 (<LOD-.060)	.088 (.078-.097)	.145 (.127-.171)	.215 (.179-.240)	1714
Age 20+ years (2013 - 2014)	.049 (.044-.053)	.046 (.043-.049)	.070 (.064-.076)	.104 (.095-.115)	.151 (.130-.170)	1810
Age 20+ years (2015 - 2016)	.049 (.046-.051)	.046 (.043-.048)	.070 (.064-.078)	.113 (.103-.122)	.151 (.130-.177)	1792
Males (2011 - 2012)	.054 (.050-.058)	.051 (.048-.057)	.078 (.071-.089)	.132 (.120-.151)	.186 (.161-.224)	1261
Males (2013 - 2014)	.048 (.043-.053)	.045 (.040-.049)	.068 (.061-.076)	.114 (.099-.123)	.163 (.145-.177)	1317
Males (2015 - 2016)	.051 (.047-.055)	.047 (.044-.052)	.076 (.067-.089)	.125 (.112-.140)	.178 (.151-.211)	1524
Females (2011 - 2012)	*	.066 (<LOD-.071)	.104 (.094-.112)	.165 (.145-.193)	.226 (.183-.303)	1241
Females (2013 - 2014)	.053 (.048-.057)	.050 (.046-.055)	.077 (.071-.084)	.114 (.104-.133)	.156 (.145-.171)	1346
Females (2015 - 2016)	.055 (.052-.059)	.051 (.048-.055)	.081 (.073-.090)	.123 (.114-.139)	.172 (.144-.196)	1534
Mexican Americans (2011 - 2012)	.063 (.059-.067)	.061 (.057-.064)	.089 (.079-.100)	.133 (.121-.153)	.183 (.150-.246)	317
Mexican Americans (2013 - 2014)	.055 (.046-.066)	.049 (.043-.057)	.076 (.063-.099)	.138 (.107-.172)	.196 (.137-.381)	453
Mexican Americans (2015 - 2016)	.062 (.057-.069)	.056 (.051-.062)	.094 (.084-.101)	.140 (.126-.166)	.224 (.166-.275)	584
Non-Hispanic blacks (2011 - 2012)	.055 (.049-.060)	.052 (.047-.058)	.077 (.069-.088)	.121 (.104-.147)	.175 (.140-.232)	669
Non-Hispanic blacks (2013 - 2014)	.049 (.046-.053)	.048 (.044-.052)	.068 (.064-.073)	.110 (.095-.122)	.164 (.133-.221)	581
Non-Hispanic blacks (2015 - 2016)	.054 (.049-.060)	.048 (.045-.052)	.080 (.068-.088)	.136 (.113-.179)	.226 (.167-.280)	669
Non-Hispanic whites (2011 - 2012)	*	.060 (<LOD-.067)	.097 (.088-.108)	.161 (.135-.183)	.224 (.181-.273)	818
Non-Hispanic whites (2013 - 2014)	.050 (.044-.056)	.047 (.042-.053)	.075 (.068-.081)	.113 (.098-.127)	.156 (.133-.171)	984
Non-Hispanic whites (2015 - 2016)	.052 (.048-.055)	.049 (.046-.053)	.077 (.068-.089)	.120 (.106-.132)	.160 (.138-.180)	924
All Hispanics (2011 - 2012)	*	.058 (<LOD-.065)	.085 (.073-.097)	.132 (.113-.161)	.181 (.153-.214)	573
All Hispanics (2013 - 2014)	.052 (.047-.059)	.047 (.043-.054)	.076 (.065-.089)	.137 (.107-.164)	.196 (.143-.326)	701
All Hispanics (2015 - 2016)	.061 (.055-.067)	.055 (.049-.060)	.092 (.085-.100)	.143 (.132-.162)	.246 (.186-.300)	981
Asians (2011 - 2012)	*	< LOD	.087 (.072-.107)	.153 (.132-.177)	.215 (.171-.290)	353
Asians (2013 - 2014)	*	.047 (<LOD-.050)	.067 (.060-.077)	.114 (.087-.145)	.160 (.133-.201)	292
Asians (2015 - 2016)	.045 (.039-.051)	.041 (.037-.047)	.067 (.056-.080)	.114 (.087-.144)	.167 (.125-.223)	332

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Antimony_BiomonitoringSummary.html

Urinary Total Arsenic (2003 – 2010)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg /L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	8.30 (7.19-9.57)	7.70 (6.90-8.90)	16.0 (14.1-18.7)	37.4 (31.6-43.5)	65.4 (48.7-83.3)	2557
Total population (2005 - 2006)	9.29 (8.05-10.7)	8.65 (7.48-9.99)	17.1 (14.9-20.6)	41.1 (33.3-49.7)	66.7 (53.7-87.0)	2576
Total population (2007 - 2008)	8.10 (7.44-8.83)	7.49 (6.90-8.12)	14.9 (13.2-17.0)	33.3 (29.8-38.7)	50.8 (42.3-65.1)	2605
Total population (2009 - 2010)	9.28 (8.47-10.2)	8.15 (7.20-8.98)	18.0 (15.3-20.8)	44.6 (39.0-55.1)	85.6 (64.7-114)	2860
Age 6-11 years (2003 - 2004)	7.08 (5.66-8.84)	6.80 (5.90-7.70)	10.9 (8.90-14.2)	24.6 (13.8-61.8)	46.9 (17.5-178)	290
Age 6-11 years (2005 - 2006)	7.19 (5.81-8.90)	6.96 (5.32-8.88)	11.5 (9.19-16.0)	19.6 (13.1-51.5)	34.1 (19.6-58.5)	355
Age 6-11 years (2007 - 2008)	6.85 (5.98-7.83)	6.40 (5.74-7.23)	10.8 (9.75-12.3)	22.5 (16.9-34.7)	41.0 (21.1-52.8)	390
Age 6-11 years (2009 - 2010)	6.63 (5.74-7.66)	5.94 (5.14-7.19)	10.8 (9.37-12.5)	26.0 (18.2-33.4)	37.7 (27.8-65.6)	378
Age 12-19 years (2003 - 2004)	8.55 (7.34-9.97)	8.10 (6.80-9.40)	15.2 (12.2-17.8)	30.5 (23.1-40.4)	46.1 (32.9-62.5)	725
Age 12-19 years (2005 - 2006)	8.19 (6.87-9.77)	7.92 (6.37-9.50)	14.0 (11.6-18.1)	28.2 (22.9-32.9)	41.9 (32.7-48.0)	701
Age 12-19 years (2007 - 2008)	7.09 (6.17-8.14)	6.87 (5.88-7.86)	11.4 (9.41-13.7)	20.4 (16.1-26.6)	38.2 (21.6-53.3)	373
Age 12-19 years (2009 - 2010)	6.45 (5.58-7.47)	6.11 (5.26-6.89)	10.8 (8.59-13.7)	25.9 (16.2-32.9)	38.8 (27.8-55.1)	454
Age 20+ years (2003 - 2004)	8.41 (7.25-9.77)	7.90 (7.00-9.10)	17.0 (15.0-19.7)	40.5 (34.9-46.2)	66.2 (51.2-93.1)	1542
Age 20+ years (2005 - 2006)	9.76 (8.43-11.3)	9.12 (7.85-10.4)	18.9 (15.8-22.9)	44.2 (35.2-56.1)	71.4 (57.7-98.3)	1520
Age 20+ years (2007 - 2008)	8.43 (7.70-9.22)	7.94 (7.09-8.67)	16.2 (14.5-18.6)	35.2 (30.4-42.3)	59.0 (44.2-75.6)	1842
Age 20+ years (2009 - 2010)	10.2 (9.14-11.3)	8.75 (7.95-9.81)	20.4 (17.2-24.1)	52.1 (42.4-66.1)	93.1 (74.2-127)	2028
Males (2003 - 2004)	9.50 (8.34-10.8)	8.90 (7.70-9.80)	17.6 (15.2-20.1)	41.6 (32.5-52.8)	65.8 (48.7-95.4)	1281
Males (2005 - 2006)	10.1 (8.61-11.8)	8.95 (8.05-10.0)	18.3 (15.5-22.9)	40.8 (31.0-52.6)	63.7 (46.4-78.7)	1271
Males (2007 - 2008)	9.25 (8.28-10.3)	8.50 (7.37-9.53)	17.0 (14.6-19.4)	36.0 (32.1-44.2)	62.5 (44.3-84.6)	1318
Males (2009 - 2010)	10.1 (9.06-11.3)	8.80 (7.80-9.75)	20.4 (16.1-23.9)	47.4 (42.1-64.1)	89.1 (71.6-114)	1401
Females (2003 - 2004)	7.30 (6.02-8.84)	6.90 (5.90-8.30)	15.0 (11.3-19.5)	33.4 (26.5-41.7)	60.5 (40.8-77.1)	1276
Females (2005 - 2006)	8.60 (7.38-10.0)	8.18 (6.64-9.97)	15.9 (13.7-19.9)	41.5 (32.2-53.7)	72.6 (54.8-122)	1305
Females (2007 - 2008)	7.14 (6.51-7.82)	6.54 (6.09-7.14)	12.7 (11.6-14.4)	30.1 (26.0-34.0)	49.1 (40.1-57.5)	1287
Females (2009 - 2010)	8.55 (7.44-9.83)	7.63 (6.45-8.62)	15.8 (13.1-19.9)	41.5 (31.7-55.5)	81.5 (54.3-132)	1459
Mexican Americans (2003 - 2004)	9.29 (8.12-10.6)	9.20 (8.10-10.3)	16.2 (13.5-19.9)	34.4 (24.0-60.5)	68.2 (41.3-111)	618
Mexican Americans (2005 - 2006)	9.55 (8.54-10.7)	9.11 (7.99-10.3)	15.6 (14.0-17.1)	29.2 (21.4-56.8)	67.6 (41.7-81.4)	652
Mexican Americans (2007 - 2008)	8.98 (8.13-9.92)	8.84 (7.80-9.48)	15.4 (12.3-19.7)	35.2 (25.0-46.0)	53.0 (44.2-77.4)	510
Mexican Americans (2009 - 2010)	8.47 (7.30-9.84)	7.96 (6.87-9.08)	13.9 (11.3-17.7)	34.7 (25.0-53.2)	60.9 (49.3-78.7)	613
Non-Hispanic blacks (2003 - 2004)	11.6 (9.50-14.1)	10.4 (7.90-11.8)	21.5 (14.9-34.4)	43.5 (36.2-61.8)	78.0 (43.6-141)	722
Non-Hispanic blacks (2005 - 2006)	11.0 (8.60-14.0)	9.55 (6.99-13.3)	21.9 (14.9-28.9)	44.9 (31.1-71.4)	82.3 (49.2-164)	692
Non-Hispanic blacks (2007 - 2008)	10.5 (9.40-11.7)	9.21 (8.22-10.4)	18.4 (16.1-21.5)	42.4 (32.9-52.8)	65.6 (45.5-112)	585
Non-Hispanic blacks (2009 - 2010)	10.9 (9.46-12.5)	9.26 (7.70-11.4)	21.7 (17.6-24.2)	49.1 (32.2-81.7)	84.8 (51.3-174)	546
Non-Hispanic whites (2003 - 2004)	7.12 (6.13-8.27)	7.00 (6.10-7.90)	13.7 (11.3-15.8)	29.0 (22.6-35.9)	53.1 (38.4-65.6)	1074
Non-Hispanic whites (2005 - 2006)	8.66 (7.20-10.4)	8.05 (6.52-9.66)	16.3 (13.4-20.6)	40.8 (29.4-50.2)	58.5 (46.0-88.0)	1041
Non-Hispanic whites (2007 - 2008)	6.98 (6.31-7.71)	6.46 (5.93-7.29)	12.4 (11.3-14.3)	28.3 (21.6-32.6)	42.1 (32.3-50.0)	1088
Non-Hispanic whites (2009 - 2010)	8.18 (7.46-8.96)	7.24 (6.46-8.21)	14.8 (12.7-17.4)	38.9 (31.7-44.4)	66.3 (49.3-88.7)	1224

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.74, 0.74, 0.74, and 0.74 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Total Arsenic (2011 – 2016)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	6.85 (5.85-8.02)	6.09 (5.22-7.12)	13.0 (10.9-16.6)	32.0 (25.9-39.0)	52.5 (41.9-66.2)	2504
Total population (2013 - 2014)	6.29 (5.58-7.08)	5.82 (5.10-6.69)	11.7 (10.5-13.2)	26.6 (23.7-30.1)	46.0 (37.5-56.1)	2662
Total population (2015 - 2016)	5.96 (5.53-6.43)	5.41 (4.92-5.84)	11.1 (9.91-12.2)	25.0 (20.8-30.0)	44.6 (35.7-53.8)	3061
Age 3-5 years (2015 - 2016)	4.05 (3.58-4.58)	3.72 (3.27-4.23)	6.67 (5.66-8.35)	12.8 (9.93-19.9)	22.4 (13.4-54.8)	486
Age 6-11 years (2011 - 2012)	6.02 (5.03-7.19)	5.50 (4.58-6.56)	10.5 (7.93-14.1)	30.1 (16.7-46.5)	53.0 (37.5-70.3)	399
Age 6-11 years (2013 - 2014)	5.21 (4.57-5.95)	4.78 (4.27-5.57)	8.79 (7.52-10.3)	17.1 (12.4-25.3)	29.0 (17.9-47.7)	402
Age 6-11 years (2015 - 2016)	4.89 (4.29-5.56)	4.51 (4.21-4.96)	7.59 (6.66-8.71)	15.7 (11.1-22.7)	28.9 (17.1-56.9)	379
Age 12-19 years (2011 - 2012)	6.01 (4.45-8.11)	5.26 (3.95-7.47)	10.9 (7.74-16.9)	25.9 (16.6-44.0)	44.0 (25.9-153)	390
Age 12-19 years (2013 - 2014)	5.79 (4.96-6.75)	5.33 (4.83-5.91)	9.40 (8.44-11.8)	22.0 (17.4-28.1)	44.1 (27.0-90.8)	451
Age 12-19 years (2015 - 2016)	5.00 (4.52-5.54)	4.75 (4.07-5.23)	8.78 (7.64-10.6)	17.1 (14.6-20.1)	29.8 (19.2-35.6)	402
Age 20+ years (2011 - 2012)	7.09 (6.03-8.33)	6.31 (5.32-7.45)	13.6 (11.3-18.3)	33.2 (26.7-39.5)	52.5 (41.9-77.3)	1715
Age 20+ years (2013 - 2014)	6.49 (5.72-7.36)	6.12 (5.22-7.06)	12.1 (10.9-14.2)	27.9 (24.1-32.1)	48.0 (37.5-57.5)	1809
Age 20+ years (2015 - 2016)	6.35 (5.88-6.84)	5.74 (5.15-6.59)	11.9 (10.7-13.7)	27.6 (23.5-33.2)	49.9 (38.9-59.9)	1794
Males (2011 - 2012)	7.69 (6.35-9.31)	6.84 (5.33-8.59)	15.4 (11.7-19.7)	33.5 (27.7-41.9)	56.5 (42.2-78.0)	1262
Males (2013 - 2014)	6.67 (5.97-7.46)	6.37 (5.68-7.12)	11.7 (10.8-13.0)	27.0 (22.3-32.5)	48.5 (33.3-57.5)	1316
Males (2015 - 2016)	6.54 (6.03-7.09)	5.66 (5.14-6.46)	11.3 (9.95-13.3)	26.7 (22.8-33.2)	49.9 (35.5-67.2)	1524
Females (2011 - 2012)	6.14 (5.22-7.22)	5.42 (4.79-6.25)	11.6 (9.85-13.7)	29.0 (22.5-38.2)	50.6 (37.5-79.8)	1242
Females (2013 - 2014)	5.94 (5.18-6.80)	5.38 (4.68-6.28)	11.2 (9.49-13.7)	26.0 (21.8-31.1)	43.6 (36.0-55.8)	1346
Females (2015 - 2016)	5.46 (4.89-6.10)	5.07 (4.50-5.65)	10.7 (9.14-12.1)	22.7 (17.6-29.5)	43.0 (32.1-51.1)	1537
Mexican Americans (2011 - 2012)	7.12 (5.73-8.84)	6.94 (5.34-8.70)	12.2 (9.84-16.5)	24.2 (18.4-35.7)	44.0 (23.8-70.3)	317
Mexican Americans (2013 - 2014)	5.73 (5.01-6.56)	5.64 (4.93-6.47)	9.19 (8.10-10.2)	17.5 (11.2-36.6)	36.6 (15.4-73.0)	453
Mexican Americans (2015 - 2016)	5.80 (5.30-6.35)	5.65 (5.15-6.17)	10.2 (8.62-11.3)	17.3 (14.6-22.8)	28.0 (18.8-54.7)	585
Non-Hispanic blacks (2011 - 2012)	9.31 (7.19-12.0)	8.18 (6.16-10.8)	17.9 (13.1-25.3)	46.8 (28.8-76.5)	82.1 (53.1-107)	669
Non-Hispanic blacks (2013 - 2014)	8.17 (6.87-9.72)	6.99 (6.01-8.20)	14.9 (10.9-18.2)	30.7 (25.5-38.2)	59.8 (40.0-79.0)	579
Non-Hispanic blacks (2015 - 2016)	7.89 (6.85-9.09)	7.00 (6.11-8.66)	15.5 (13.3-17.4)	31.2 (24.6-49.2)	62.7 (33.8-133)	671
Non-Hispanic whites (2011 - 2012)	5.89 (4.92-7.06)	5.08 (4.56-6.06)	10.8 (8.48-15.5)	26.3 (20.3-34.9)	43.2 (34.9-56.0)	820
Non-Hispanic whites (2013 - 2014)	5.67 (4.88-6.59)	5.30 (4.40-6.62)	11.0 (9.16-12.7)	22.4 (17.6-29.9)	39.0 (30.8-50.6)	985
Non-Hispanic whites (2015 - 2016)	5.17 (4.75-5.62)	4.64 (4.39-4.96)	9.61 (8.15-11.2)	20.4 (15.3-25.2)	36.1 (25.2-46.3)	924
All Hispanics (2011 - 2012)	7.62 (6.63-8.76)	7.32 (6.31-8.35)	13.7 (11.7-16.6)	25.8 (21.2-29.8)	45.6 (28.7-55.8)	573
All Hispanics (2013 - 2014)	6.16 (5.24-7.22)	5.93 (5.02-6.82)	10.4 (9.11-11.9)	20.2 (14.2-30.1)	37.5 (24.1-57.9)	701
All Hispanics (2015 - 2016)	6.38 (5.83-6.98)	5.94 (5.56-6.34)	11.1 (9.43-12.5)	22.9 (17.8-28.0)	40.6 (28.0-70.1)	982
Asians (2011 - 2012)	16.7 (14.7-18.9)	14.9 (12.8-19.0)	39.0 (33.2-44.8)	83.2 (61.4-108)	117 (88.4-145)	353
Asians (2013 - 2014)	12.1 (10.4-14.1)	11.5 (9.08-13.6)	30.8 (23.2-37.0)	70.7 (52.5-90.8)	126 (79.2-181)	292
Asians (2015 - 2016)	14.3 (11.6-17.7)	14.7 (10.9-17.9)	32.1 (21.2-47.4)	62.4 (50.5-85.5)	92.5 (65.7-127)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 1.25, 0.26, and 0.26, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Total Arsenic (creatinine corrected) (2003 – 2010)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg /g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	8.24 (7.07-9.59)	7.04 (5.93-8.51)	14.1 (11.6-17.2)	30.4 (26.0-38.7)	50.4 (40.3-64.5)	2557
Total population (2005 - 2006)	9.15 (7.93-10.6)	7.70 (6.55-8.98)	15.2 (11.7-19.4)	35.1 (26.5-44.7)	62.8 (44.7-85.0)	2576
Total population (2007 - 2008)	8.46 (7.78-9.21)	7.06 (6.56-7.74)	13.8 (12.5-15.2)	28.9 (24.2-36.7)	49.0 (38.8-70.5)	2605
Total population (2009 - 2010)	9.90 (9.06-10.8)	7.90 (6.98-8.97)	17.6 (15.4-20.2)	45.2 (36.6-53.3)	80.8 (60.5-94.4)	2860
Age 6-11 years (2003 - 2004)	8.25 (6.58-10.3)	7.18 (5.93-9.45)	11.7 (9.10-16.3)	22.2 (12.0-69.5)	40.1 (14.7-188)	290
Age 6-11 years (2005 - 2006)	8.88 (7.05-11.2)	7.87 (6.19-9.42)	11.8 (9.32-18.9)	24.5 (13.0-62.8)	45.4 (22.9-80.9)	355
Age 6-11 years (2007 - 2008)	8.87 (8.06-9.77)	7.53 (6.73-7.88)	13.4 (10.2-16.0)	26.7 (19.9-34.0)	37.2 (28.6-71.4)	390
Age 6-11 years (2009 - 2010)	8.97 (7.93-10.2)	7.42 (6.70-8.32)	11.0 (9.90-14.0)	33.5 (17.0-54.6)	60.8 (36.6-84.9)	378
Age 12-19 years (2003 - 2004)	6.11 (5.23-7.13)	5.06 (4.47-6.04)	9.66 (7.44-11.2)	17.8 (12.0-26.0)	27.8 (20.7-35.9)	725
Age 12-19 years (2005 - 2006)	6.30 (5.56-7.14)	5.19 (4.80-6.19)	9.62 (8.12-11.1)	19.4 (13.9-25.8)	28.0 (21.9-33.2)	701
Age 12-19 years (2007 - 2008)	5.50 (4.91-6.16)	4.96 (4.25-5.40)	7.69 (6.09-9.31)	16.8 (10.8-21.1)	22.5 (16.8-29.1)	373
Age 12-19 years (2009 - 2010)	6.06 (5.34-6.87)	4.95 (4.39-5.81)	9.18 (7.00-11.0)	19.2 (14.5-21.3)	28.4 (20.8-35.7)	454
Age 20+ years (2003 - 2004)	8.64 (7.38-10.1)	7.47 (6.20-9.01)	15.4 (12.7-18.8)	33.8 (27.3-41.2)	53.9 (45.4-64.5)	1542
Age 20+ years (2005 - 2006)	9.75 (8.46-11.2)	8.22 (6.98-9.75)	17.0 (12.8-21.3)	41.0 (29.6-52.5)	68.4 (52.8-89.7)	1520
Age 20+ years (2007 - 2008)	9.00 (8.20-9.88)	7.55 (6.79-8.53)	14.9 (13.1-17.1)	32.5 (25.8-41.0)	59.4 (41.0-86.2)	1842
Age 20+ years (2009 - 2010)	10.8 (9.71-12.0)	8.73 (7.69-9.71)	20.1 (16.5-24.2)	50.8 (40.5-59.7)	87.3 (70.0-105)	2028
Males (2003 - 2004)	8.00 (6.81-9.40)	6.75 (5.66-8.35)	13.7 (11.0-18.0)	28.7 (25.1-36.4)	45.6 (35.3-62.1)	1281
Males (2005 - 2006)	8.26 (7.09-9.63)	7.16 (5.87-8.54)	12.9 (10.2-18.0)	28.8 (22.9-36.3)	46.1 (35.1-66.5)	1271
Males (2007 - 2008)	8.30 (7.49-9.18)	6.79 (6.39-7.61)	13.2 (11.8-15.2)	28.9 (23.5-38.5)	47.7 (35.7-68.1)	1318
Males (2009 - 2010)	9.21 (8.55-9.93)	7.22 (6.43-8.67)	17.0 (14.9-18.6)	41.8 (35.4-47.9)	66.9 (52.0-81.5)	1401
Females (2003 - 2004)	8.47 (7.12-10.1)	7.33 (6.10-8.75)	14.4 (11.7-17.7)	32.3 (24.2-46.6)	58.4 (42.8-75.0)	1276
Females (2005 - 2006)	10.1 (8.72-11.7)	8.29 (7.23-9.87)	17.4 (13.0-21.4)	43.8 (29.2-61.5)	74.1 (55.0-96.2)	1305
Females (2007 - 2008)	8.63 (7.91-9.41)	7.13 (6.53-8.33)	14.1 (12.3-16.9)	27.9 (24.1-37.0)	51.4 (39.7-83.3)	1287
Females (2009 - 2010)	10.6 (9.36-12.0)	8.38 (7.40-9.41)	18.6 (14.9-23.9)	50.8 (35.1-72.9)	87.8 (66.8-109)	1459
Mexican Americans (2003 - 2004)	8.61 (7.33-10.1)	7.76 (6.30-9.44)	12.6 (10.2-15.9)	24.0 (17.7-34.8)	42.4 (24.8-62.4)	618
Mexican Americans (2005 - 2006)	8.98 (7.89-10.2)	7.48 (6.72-8.87)	12.8 (11.0-16.3)	28.1 (21.1-35.5)	49.1 (31.0-108)	652
Mexican Americans (2007 - 2008)	8.88 (7.71-10.2)	7.38 (6.51-8.63)	14.1 (10.6-17.8)	28.6 (22.5-35.3)	48.2 (31.1-75.7)	510
Mexican Americans (2009 - 2010)	8.88 (7.87-10.0)	7.62 (6.69-8.45)	13.2 (10.7-17.2)	31.4 (23.7-38.5)	49.8 (37.5-68.9)	613
Non-Hispanic blacks (2003 - 2004)	8.31 (6.99-9.88)	6.88 (5.66-8.41)	13.8 (11.5-17.0)	27.6 (17.9-56.0)	54.3 (27.5-120)	722
Non-Hispanic blacks (2005 - 2006)	7.96 (6.40-9.92)	6.48 (5.21-8.30)	13.4 (10.0-18.6)	32.5 (18.7-66.5)	71.4 (35.6-98.8)	692
Non-Hispanic blacks (2007 - 2008)	7.72 (6.98-8.54)	6.60 (6.01-7.56)	13.4 (11.5-15.4)	25.7 (22.1-30.0)	42.7 (31.4-60.3)	585
Non-Hispanic blacks (2009 - 2010)	8.67 (7.54-9.98)	7.26 (5.96-9.02)	15.6 (12.4-21.3)	38.7 (31.5-48.7)	63.9 (43.1-102)	546
Non-Hispanic whites (2003 - 2004)	7.50 (6.25-9.01)	6.32 (5.28-7.96)	12.5 (9.86-17.1)	26.8 (21.8-32.0)	40.0 (31.3-53.9)	1074
Non-Hispanic whites (2005 - 2006)	9.01 (7.57-10.7)	7.68 (6.18-9.56)	14.3 (11.1-20.8)	31.9 (24.1-46.1)	59.4 (37.9-96.2)	1041
Non-Hispanic whites (2007 - 2008)	7.82 (7.05-8.68)	6.72 (6.00-7.54)	12.5 (11.1-13.9)	24.6 (19.6-32.3)	43.1 (29.1-64.0)	1088
Non-Hispanic whites (2009 - 2010)	9.14 (8.35-10.0)	7.10 (6.43-8.06)	15.8 (13.7-18.4)	40.9 (30.4-50.8)	66.4 (50.9-90.0)	1224

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Total Arsenic (creatinine corrected) (2011 – 2016)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	7.77 (6.85-8.81)	6.39 (5.57-7.24)	13.7 (11.5-16.5)	30.8 (24.6-38.6)	50.4 (38.2-70.1)	2502
Total population (2013 - 2014)	7.27 (6.62-7.99)	6.10 (5.39-6.88)	11.9 (10.5-13.5)	27.6 (23.8-32.8)	52.0 (43.5-60.9)	2661
Total population (2015 - 2016)	6.69 (6.32-7.08)	5.56 (5.32-5.85)	10.7 (9.74-11.5)	24.9 (20.1-30.0)	45.8 (32.0-65.3)	3058
Age 3-5 years (2015 - 2016)	9.31 (8.18-10.6)	8.27 (7.40-9.15)	12.5 (10.6-14.9)	21.1 (17.3-28.8)	40.9 (22.8-83.5)	485
Age 6-11 years (2011 - 2012)	8.63 (7.26-10.3)	6.87 (5.84-8.00)	12.3 (9.58-15.5)	27.7 (17.7-57.7)	91.2 (26.2-129)	398
Age 6-11 years (2013 - 2014)	7.78 (7.08-8.54)	6.91 (5.91-7.65)	12.5 (10.3-13.6)	17.7 (16.1-21.1)	29.9 (20.4-52.1)	402
Age 6-11 years (2015 - 2016)	6.93 (6.48-7.41)	6.09 (5.66-6.56)	9.53 (8.15-11.0)	18.2 (13.6-25.0)	28.1 (21.9-40.6)	379
Age 12-19 years (2011 - 2012)	5.75 (4.49-7.36)	4.69 (3.70-5.73)	8.73 (6.26-13.3)	22.1 (11.5-52.6)	34.9 (21.1-159)	390
Age 12-19 years (2013 - 2014)	5.24 (4.53-6.06)	4.21 (3.61-4.61)	7.92 (5.75-10.3)	17.6 (12.6-23.0)	30.5 (20.3-54.1)	451
Age 12-19 years (2015 - 2016)	4.67 (4.34-5.03)	3.94 (3.55-4.54)	7.09 (5.91-7.91)	14.7 (11.6-16.8)	22.3 (15.4-31.5)	402
Age 20+ years (2011 - 2012)	8.04 (7.07-9.14)	6.52 (5.88-7.69)	14.8 (12.1-18.8)	32.4 (25.2-39.8)	49.7 (38.2-70.1)	1714
Age 20+ years (2013 - 2014)	7.58 (6.87-8.36)	6.39 (5.66-7.29)	12.4 (10.9-14.7)	31.0 (26.0-37.9)	54.0 (47.9-66.1)	1808
Age 20+ years (2015 - 2016)	6.92 (6.51-7.35)	5.62 (5.27-5.95)	11.0 (10.3-12.5)	28.1 (21.9-33.6)	56.2 (36.5-74.6)	1792
Males (2011 - 2012)	7.20 (6.15-8.43)	6.13 (5.18-7.23)	12.5 (10.5-15.2)	28.3 (20.2-34.9)	50.4 (33.3-69.6)	1261
Males (2013 - 2014)	6.69 (6.07-7.38)	5.55 (4.96-6.26)	10.9 (9.50-12.5)	26.0 (19.5-30.6)	47.9 (36.5-55.3)	1315
Males (2015 - 2016)	6.21 (5.75-6.71)	5.23 (4.70-5.70)	9.81 (8.68-11.0)	22.3 (18.1-28.1)	43.3 (30.4-61.5)	1524
Females (2011 - 2012)	8.35 (7.40-9.42)	6.64 (6.12-7.37)	15.0 (12.2-19.1)	33.1 (26.1-41.4)	50.7 (39.8-79.0)	1241
Females (2013 - 2014)	7.88 (7.03-8.82)	6.67 (5.82-7.78)	13.1 (10.9-15.6)	31.3 (24.9-39.4)	54.1 (46.3-68.3)	1346
Females (2015 - 2016)	7.19 (6.54-7.89)	5.94 (5.47-6.40)	11.3 (9.96-13.8)	25.9 (20.0-33.4)	48.2 (31.5-71.1)	1534
Mexican Americans (2011 - 2012)	8.00 (6.85-9.36)	6.91 (6.07-7.98)	11.9 (9.05-14.6)	26.1 (16.7-39.4)	40.8 (24.0-70.1)	317
Mexican Americans (2013 - 2014)	6.54 (5.70-7.51)	5.83 (5.08-6.54)	8.97 (7.32-11.6)	17.1 (12.6-20.8)	29.2 (15.1-72.2)	453
Mexican Americans (2015 - 2016)	6.30 (5.77-6.88)	5.41 (5.14-5.91)	9.08 (7.94-10.8)	16.9 (13.8-20.2)	26.4 (19.5-41.2)	584
Non-Hispanic blacks (2011 - 2012)	7.24 (5.51-9.51)	5.83 (4.65-7.96)	13.5 (9.02-19.0)	28.8 (21.5-46.3)	55.4 (31.6-87.1)	669
Non-Hispanic blacks (2013 - 2014)	6.23 (5.25-7.39)	4.86 (4.24-6.22)	10.3 (8.03-13.4)	22.7 (17.8-29.1)	37.4 (25.8-70.5)	579
Non-Hispanic blacks (2015 - 2016)	6.28 (5.43-7.26)	5.21 (4.58-6.14)	11.1 (8.39-14.3)	26.5 (20.0-32.3)	41.2 (29.1-72.2)	669
Non-Hispanic whites (2011 - 2012)	7.13 (6.05-8.39)	5.72 (5.05-6.70)	12.4 (10.3-15.4)	28.4 (21.7-37.5)	46.5 (33.1-75.8)	818
Non-Hispanic whites (2013 - 2014)	7.01 (6.25-7.87)	5.87 (5.13-6.88)	11.6 (9.92-13.7)	27.5 (21.6-35.8)	49.5 (40.8-55.3)	984
Non-Hispanic whites (2015 - 2016)	6.09 (5.64-6.59)	5.14 (4.80-5.52)	9.30 (8.16-10.6)	19.9 (15.7-25.9)	33.8 (25.3-62.5)	924
All Hispanics (2011 - 2012)	8.53 (7.74-9.40)	7.60 (6.84-8.42)	12.8 (11.2-14.1)	25.3 (20.8-30.8)	37.5 (28.2-50.6)	573
All Hispanics (2013 - 2014)	6.87 (6.08-7.76)	6.26 (5.36-6.89)	10.3 (8.75-11.9)	18.7 (14.3-24.0)	28.7 (18.9-50.7)	701
All Hispanics (2015 - 2016)	7.19 (6.70-7.72)	6.05 (5.58-6.80)	11.0 (9.69-12.1)	20.8 (18.3-24.0)	39.5 (26.6-61.2)	981
Asians (2011 - 2012)	22.3 (19.1-26.1)	20.1 (16.3-25.2)	39.4 (32.2-61.0)	100 (73.2-129)	162 (114-202)	353
Asians (2013 - 2014)	19.0 (16.1-22.5)	15.2 (13.0-19.2)	41.9 (31.1-59.2)	95.0 (74.2-131)	137 (111-229)	292
Asians (2015 - 2016)	19.6 (15.9-24.1)	18.6 (13.9-25.4)	41.0 (30.9-47.6)	74.3 (51.3-113)	118 (73.7-173)	332

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Inorganic-related Arsenic Species (2003 – 2010)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	6.52 (6.03-7.04)	6.10 (5.50-6.40)	8.60 (8.00-9.50)	14.0 (12.5-15.4)	19.1 (15.8-22.9)	2572
Total population (2005 - 2006)	6.84 (6.35-7.38)	6.40 (5.88-6.85)	9.00 (8.19-10.0)	13.9 (12.0-16.5)	18.5 (15.8-21.7)	2588
Total population (2007 - 2008)	6.47 (6.20-6.76)	6.02 (5.74-6.26)	8.55 (8.03-9.22)	12.9 (11.8-14.0)	16.8 (14.7-18.9)	2576
Total population (2009 - 2010)	6.56 (6.23-6.90)	5.87 (5.57-6.09)	8.80 (8.14-9.47)	14.6 (12.3-17.2)	20.8 (17.8-24.5)	2852
Age 6-11 years (2003 - 2004)	6.46 (5.67-7.35)	6.10 (5.80-6.90)	8.50 (7.10-10.0)	12.1 (10.0-14.7)	15.0 (10.7-26.3)	292
Age 6-11 years (2005 - 2006)	6.71 (6.13-7.35)	6.27 (5.44-6.98)	8.46 (7.48-9.72)	13.5 (9.72-16.1)	16.1 (14.0-18.3)	354
Age 6-11 years (2007 - 2008)	6.70 (6.15-7.31)	6.08 (5.77-6.44)	8.78 (7.72-10.3)	13.9 (10.9-16.5)	18.3 (12.2-42.3)	390
Age 6-11 years (2009 - 2010)	6.29 (5.85-6.75)	5.80 (5.11-6.32)	8.34 (7.67-9.07)	13.2 (10.7-14.6)	16.0 (14.0-17.9)	379
Age 12-19 years (2003 - 2004)	6.72 (6.08-7.42)	6.10 (5.90-7.00)	8.80 (7.70-10.4)	13.1 (10.6-16.6)	16.7 (14.5-20.3)	729
Age 12-19 years (2005 - 2006)	6.82 (6.18-7.53)	6.38 (5.67-7.45)	8.78 (7.77-10.4)	13.1 (10.9-15.4)	16.4 (13.3-17.7)	703
Age 12-19 years (2007 - 2008)	6.42 (5.89-6.99)	6.34 (5.60-6.95)	8.15 (7.33-9.69)	11.8 (10.5-13.4)	14.6 (12.0-18.1)	366
Age 12-19 years (2009 - 2010)	5.84 (5.43-6.27)	5.31 (4.89-5.85)	7.67 (6.79-8.60)	11.4 (9.66-13.1)	13.9 (11.8-17.0)	453
Age 20+ years (2003 - 2004)	6.49 (6.02-7.00)	6.00 (5.30-6.20)	8.60 (8.10-9.40)	14.1 (12.7-15.6)	19.5 (16.8-24.9)	1550
Age 20+ years (2005 - 2006)	6.86 (6.34-7.42)	6.43 (5.83-6.87)	9.10 (8.22-10.2)	14.1 (12.0-17.3)	19.9 (15.8-24.0)	1531
Age 20+ years (2007 - 2008)	6.46 (6.17-6.76)	5.95 (5.71-6.18)	8.57 (8.00-9.40)	13.0 (11.8-14.2)	17.2 (15.0-19.2)	1820
Age 20+ years (2009 - 2010)	6.70 (6.33-7.10)	5.95 (5.71-6.20)	9.12 (8.20-9.87)	15.4 (12.6-19.6)	23.2 (19.4-27.4)	2020
Males (2003 - 2004)	7.03 (6.38-7.74)	6.40 (6.00-7.10)	9.20 (8.30-10.5)	14.8 (12.7-18.1)	21.3 (16.0-28.1)	1283
Males (2005 - 2006)	7.10 (6.56-7.68)	6.59 (6.10-7.05)	9.37 (8.22-10.5)	14.3 (11.6-17.7)	18.4 (14.9-23.1)	1276
Males (2007 - 2008)	6.94 (6.54-7.36)	6.44 (6.13-6.87)	9.22 (8.53-9.89)	13.5 (12.4-15.2)	18.3 (14.9-26.4)	1289
Males (2009 - 2010)	6.80 (6.30-7.34)	6.09 (5.71-6.54)	9.06 (8.27-9.89)	15.0 (12.0-20.4)	23.5 (16.3-29.4)	1396
Females (2003 - 2004)	6.08 (5.62-6.57)	5.50 (5.10-6.10)	8.10 (7.10-9.10)	12.7 (11.1-14.9)	17.3 (14.6-21.9)	1289
Females (2005 - 2006)	6.60 (6.11-7.14)	6.14 (5.47-6.81)	8.77 (8.06-9.51)	13.3 (11.7-16.2)	18.6 (15.8-22.0)	1312
Females (2007 - 2008)	6.06 (5.81-6.33)	5.66 (5.42-5.84)	7.96 (7.35-8.59)	11.9 (10.7-13.7)	15.8 (14.0-16.8)	1287
Females (2009 - 2010)	6.33 (5.98-6.70)	5.64 (5.21-5.95)	8.36 (7.70-9.60)	14.2 (12.1-16.2)	19.6 (17.8-21.1)	1456
Mexican Americans (2003 - 2004)	7.72 (7.09-8.41)	7.10 (6.50-8.00)	10.1 (9.10-11.8)	15.5 (12.8-20.5)	22.7 (16.5-29.4)	622
Mexican Americans (2005 - 2006)	7.27 (6.94-7.62)	7.05 (6.69-7.42)	9.83 (9.21-10.5)	12.5 (11.7-14.5)	16.1 (13.9-18.5)	651
Mexican Americans (2007 - 2008)	7.22 (6.80-7.66)	7.02 (6.43-7.46)	9.89 (9.18-10.3)	12.7 (11.3-14.3)	15.3 (13.6-23.3)	513
Mexican Americans (2009 - 2010)	6.76 (6.19-7.38)	6.31 (5.48-7.19)	9.12 (8.06-10.3)	14.1 (11.9-16.5)	19.8 (15.8-22.2)	618
Non-Hispanic blacks (2003 - 2004)	7.04 (6.42-7.73)	6.50 (6.10-7.30)	9.30 (8.70-10.3)	15.7 (12.3-18.1)	19.4 (17.1-21.4)	725
Non-Hispanic blacks (2005 - 2006)	7.05 (6.36-7.82)	6.48 (5.73-7.16)	8.85 (7.77-9.80)	14.0 (11.0-16.5)	17.9 (14.5-31.0)	695
Non-Hispanic blacks (2007 - 2008)	7.06 (6.76-7.38)	6.45 (6.00-6.81)	9.43 (8.55-10.3)	14.5 (13.3-15.8)	18.5 (15.8-23.5)	586
Non-Hispanic blacks (2009 - 2010)	7.03 (6.44-7.67)	6.28 (5.66-6.92)	9.84 (8.48-11.4)	16.0 (12.7-19.9)	22.2 (17.8-33.5)	543
Non-Hispanic whites (2003 - 2004)	5.96 (5.54-6.41)	5.50 (5.10-6.10)	7.70 (7.10-8.50)	12.0 (9.80-13.7)	15.1 (12.8-18.1)	1081
Non-Hispanic whites (2005 - 2006)	6.55 (5.96-7.20)	6.10 (5.42-6.83)	8.50 (7.74-9.73)	13.3 (11.1-16.2)	17.3 (14.1-21.4)	1050
Non-Hispanic whites (2007 - 2008)	5.95 (5.69-6.23)	5.66 (5.35-5.96)	7.72 (7.26-8.25)	11.1 (10.3-12.2)	14.0 (12.5-16.1)	1063
Non-Hispanic whites (2009 - 2010)	5.96 (5.75-6.18)	5.46 (5.22-5.65)	7.89 (7.56-8.19)	11.5 (10.1-13.3)	15.3 (13.3-18.8)	1210

**See [Calculation of Inorganic-related Arsenic Species](#) for additional information.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Inorganic-related Arsenic Species (2011 – 2016)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	5.59 (5.24-5.96)	5.15 (4.73-5.56)	7.73 (7.09-8.57)	12.2 (11.1-13.9)	17.2 (14.6-19.9)	2517
Total population (2013 - 2014)	4.80 (4.53-5.09)	4.53 (4.18-4.94)	7.22 (6.74-7.70)	11.2 (10.3-12.0)	14.7 (13.5-16.8)	2654
Total population (2015 - 2016)	4.41 (4.17-4.67)	4.08 (3.79-4.49)	6.55 (6.16-7.06)	10.5 (9.43-11.7)	14.5 (12.8-17.3)	3094
Age 3-5 years (2015 - 2016)	4.03 (3.71-4.36)	3.75 (3.50-3.96)	5.57 (5.12-6.43)	9.54 (7.82-11.8)	13.2 (10.3-20.6)	507
Age 6-11 years (2011 - 2012)	5.48 (5.05-5.95)	5.36 (4.50-5.98)	7.58 (7.08-8.34)	11.2 (9.93-12.1)	13.4 (11.6-16.2)	401
Age 6-11 years (2013 - 2014)	4.91 (4.44-5.43)	4.59 (4.02-5.00)	7.21 (6.20-8.38)	11.3 (9.91-13.9)	14.2 (11.4-19.6)	397
Age 6-11 years (2015 - 2016)	4.32 (4.00-4.68)	4.12 (3.66-4.56)	6.15 (5.45-6.66)	9.05 (7.98-11.1)	13.1 (10.2-21.0)	380
Age 12-19 years (2011 - 2012)	5.37 (4.67-6.17)	5.09 (4.24-6.00)	7.28 (6.27-8.32)	11.1 (8.34-14.9)	15.6 (10.8-23.9)	392
Age 12-19 years (2013 - 2014)	5.09 (4.64-5.57)	5.02 (4.51-5.46)	7.29 (6.53-8.08)	11.9 (9.80-13.7)	14.5 (12.5-15.9)	450
Age 12-19 years (2015 - 2016)	4.32 (3.97-4.70)	4.01 (3.58-4.52)	6.03 (5.37-6.77)	10.1 (8.75-11.8)	14.2 (11.2-17.1)	402
Age 20+ years (2011 - 2012)	5.64 (5.28-6.01)	5.15 (4.71-5.57)	7.83 (7.07-8.88)	12.5 (11.2-14.8)	17.6 (15.2-20.0)	1724
Age 20+ years (2013 - 2014)	4.75 (4.46-5.05)	4.45 (4.08-4.91)	7.20 (6.63-7.72)	11.2 (10.3-11.8)	14.8 (12.9-17.1)	1807
Age 20+ years (2015 - 2016)	4.45 (4.20-4.73)	4.14 (3.79-4.58)	6.78 (6.30-7.26)	11.0 (9.56-12.2)	14.6 (12.8-17.9)	1805
Males (2011 - 2012)	6.00 (5.52-6.52)	5.63 (5.11-6.28)	8.31 (7.29-9.94)	13.4 (11.7-16.5)	18.8 (16.7-20.8)	1264
Males (2013 - 2014)	5.02 (4.78-5.28)	4.92 (4.45-5.32)	7.45 (7.09-7.94)	11.4 (10.3-12.1)	14.8 (13.5-16.1)	1308
Males (2015 - 2016)	4.67 (4.38-4.98)	4.44 (3.94-4.93)	6.92 (6.36-7.68)	11.3 (9.65-12.6)	14.7 (12.8-18.3)	1537
Females (2011 - 2012)	5.23 (4.90-5.58)	4.70 (4.36-5.05)	7.16 (6.47-8.01)	11.6 (10.1-12.9)	14.9 (12.3-20.5)	1253
Females (2013 - 2014)	4.59 (4.26-4.96)	4.29 (3.87-4.69)	6.94 (5.99-7.67)	10.8 (10.0-12.1)	14.7 (12.8-18.3)	1346
Females (2015 - 2016)	4.18 (3.95-4.42)	3.89 (3.53-4.08)	6.36 (5.79-6.78)	10.0 (8.86-11.3)	14.3 (12.7-16.2)	1557
Mexican Americans (2011 - 2012)	5.76 (5.37-6.18)	5.26 (5.02-5.77)	7.71 (7.37-8.54)	11.9 (10.1-13.8)	16.8 (12.1-19.9)	317
Mexican Americans (2013 - 2014)	5.01 (4.77-5.27)	5.14 (4.62-5.52)	7.21 (6.84-7.70)	10.3 (9.54-11.3)	12.4 (11.2-16.2)	455
Mexican Americans (2015 - 2016)	4.75 (4.34-5.21)	4.58 (4.16-5.01)	6.73 (6.07-7.73)	10.9 (9.32-13.0)	15.2 (11.3-19.3)	591
Non-Hispanic blacks (2011 - 2012)	6.20 (5.52-6.97)	5.77 (5.09-6.42)	8.81 (7.43-10.6)	14.4 (12.1-18.0)	20.5 (16.5-25.4)	672
Non-Hispanic blacks (2013 - 2014)	5.58 (5.03-6.20)	5.28 (4.84-5.81)	7.81 (6.82-9.63)	13.4 (10.6-15.7)	19.2 (13.5-25.0)	576
Non-Hispanic blacks (2015 - 2016)	5.07 (4.60-5.59)	4.84 (4.21-5.38)	7.99 (6.54-8.91)	12.8 (11.5-14.9)	18.1 (14.1-21.4)	678
Non-Hispanic whites (2011 - 2012)	5.10 (4.79-5.43)	4.69 (4.35-5.11)	7.01 (6.36-7.72)	10.7 (8.90-12.1)	12.9 (11.9-16.0)	825
Non-Hispanic whites (2013 - 2014)	4.35 (4.02-4.71)	4.12 (3.67-4.47)	6.46 (5.79-7.21)	9.95 (8.65-10.9)	12.3 (10.9-14.0)	980
Non-Hispanic whites (2015 - 2016)	3.93 (3.72-4.15)	3.60 (3.37-3.94)	5.86 (5.29-6.51)	8.54 (7.90-9.02)	11.4 (9.56-12.8)	937
All Hispanics (2011 - 2012)	6.22 (5.52-7.01)	5.72 (5.08-6.51)	8.97 (7.41-11.1)	14.5 (11.4-19.0)	19.9 (15.8-21.6)	574
All Hispanics (2013 - 2014)	5.31 (4.87-5.80)	5.34 (4.64-6.01)	7.92 (7.18-8.84)	11.7 (10.5-12.9)	14.8 (12.4-16.2)	703
All Hispanics (2015 - 2016)	5.04 (4.60-5.52)	4.80 (4.41-5.21)	7.41 (6.49-8.96)	12.1 (10.3-14.0)	17.1 (13.6-19.3)	992
Asians (2011 - 2012)	10.1 (9.11-11.2)	9.53 (8.32-11.1)	17.8 (14.6-19.9)	29.6 (24.5-34.2)	42.3 (33.0-46.4)	356
Asians (2013 - 2014)	7.60 (7.10-8.14)	7.69 (6.65-8.90)	13.8 (11.0-14.9)	23.0 (18.3-24.3)	28.0 (23.1-39.4)	291
Asians (2015 - 2016)	8.15 (7.14-9.30)	7.93 (6.77-9.35)	14.7 (12.2-17.3)	23.2 (17.4-30.8)	30.8 (23.7-43.8)	334

**See [Calculation of Inorganic-related Arsenic Species](#) for additional information. Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 4.04, 3.02, and 3.02, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Inorganic-related Arsenic Species (creatinine corrected) (2003 – 2010)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	6.47 (5.84-7.16)	5.95 (5.40-6.62)	9.64 (8.25-11.4)	15.7 (13.3-18.5)	20.0 (17.4-23.9)	2569
Total population (2005 - 2006)	6.72 (6.30-7.17)	6.21 (5.81-6.58)	9.75 (8.81-11.0)	16.2 (14.2-18.0)	21.3 (18.7-24.3)	2588
Total population (2007 - 2008)	6.75 (6.41-7.12)	6.42 (5.97-6.88)	9.77 (9.03-10.6)	15.5 (14.2-17.0)	21.2 (18.1-23.3)	2576
Total population (2009 - 2010)	6.94 (6.55-7.36)	6.55 (6.04-7.00)	10.3 (9.58-11.0)	16.4 (14.9-17.9)	22.5 (19.0-26.5)	2851
Age 6-11 years (2003 - 2004)	7.52 (6.45-8.77)	6.51 (6.05-8.30)	10.5 (8.06-13.5)	16.8 (12.4-19.7)	19.2 (14.3-41.3)	292
Age 6-11 years (2005 - 2006)	8.28 (7.20-9.52)	7.73 (6.44-8.96)	10.7 (8.86-14.1)	17.4 (13.6-22.1)	24.0 (18.8-26.2)	354
Age 6-11 years (2007 - 2008)	8.81 (7.92-9.80)	8.09 (7.23-9.44)	12.1 (10.8-13.9)	18.3 (15.5-23.4)	24.5 (18.4-37.9)	390
Age 6-11 years (2009 - 2010)	8.47 (7.76-9.25)	7.92 (7.20-8.73)	10.7 (9.71-12.6)	17.0 (13.8-22.3)	24.9 (14.8-42.2)	378
Age 12-19 years (2003 - 2004)	4.79 (4.33-5.29)	4.46 (3.98-5.00)	6.31 (5.46-7.44)	8.96 (8.17-11.4)	12.8 (10.2-15.7)	728
Age 12-19 years (2005 - 2006)	5.24 (4.95-5.55)	4.97 (4.61-5.44)	7.23 (6.71-7.72)	10.7 (9.48-11.6)	13.3 (11.5-15.5)	703
Age 12-19 years (2007 - 2008)	5.00 (4.64-5.39)	4.72 (4.47-5.13)	6.68 (5.85-7.49)	9.85 (7.88-11.8)	12.1 (10.2-14.8)	366
Age 12-19 years (2009 - 2010)	5.44 (4.97-5.95)	4.83 (4.46-5.50)	8.10 (6.54-9.23)	12.1 (10.4-15.1)	16.6 (13.6-20.5)	453
Age 20+ years (2003 - 2004)	6.67 (6.00-7.41)	6.12 (5.54-7.03)	10.2 (8.51-12.0)	15.9 (13.8-19.2)	21.2 (18.2-25.5)	1548
Age 20+ years (2005 - 2006)	6.82 (6.39-7.28)	6.27 (5.80-6.79)	10.3 (9.07-11.5)	16.7 (14.5-18.9)	22.2 (19.3-25.9)	1531
Age 20+ years (2007 - 2008)	6.87 (6.48-7.29)	6.54 (6.14-7.08)	9.90 (9.10-11.1)	16.2 (14.2-18.0)	21.3 (18.2-24.3)	1820
Age 20+ years (2009 - 2010)	7.06 (6.61-7.53)	6.67 (6.13-7.09)	10.6 (9.71-11.4)	17.0 (15.0-18.9)	23.3 (19.5-27.5)	2020
Males (2003 - 2004)	5.93 (5.19-6.78)	5.43 (4.73-6.14)	8.57 (7.19-10.7)	13.7 (11.4-17.4)	19.4 (14.7-25.6)	1283
Males (2005 - 2006)	5.83 (5.41-6.28)	5.43 (5.00-5.90)	8.27 (7.26-9.46)	12.9 (11.3-15.5)	18.0 (14.2-20.4)	1276
Males (2007 - 2008)	6.21 (5.91-6.53)	5.89 (5.47-6.27)	8.87 (8.27-9.71)	14.3 (12.7-16.6)	18.9 (17.0-21.3)	1289
Males (2009 - 2010)	6.17 (5.82-6.54)	5.70 (5.34-6.30)	8.95 (8.40-9.46)	14.3 (12.5-15.8)	18.1 (16.0-22.0)	1395
Females (2003 - 2004)	7.02 (6.45-7.64)	6.59 (5.94-7.20)	10.5 (8.95-12.4)	16.8 (14.9-19.1)	20.6 (18.0-25.4)	1285
Females (2005 - 2006)	7.70 (7.22-8.21)	7.11 (6.54-7.73)	11.4 (10.3-13.1)	17.9 (16.2-20.0)	25.7 (22.1-28.5)	1312
Females (2007 - 2008)	7.30 (6.85-7.77)	7.00 (6.44-7.48)	10.4 (9.59-11.5)	16.2 (13.7-20.1)	22.7 (18.9-28.3)	1287
Females (2009 - 2010)	7.77 (7.27-8.31)	7.29 (6.80-7.91)	11.7 (10.9-12.5)	18.9 (16.3-22.0)	26.5 (20.4-34.0)	1456
Mexican Americans (2003 - 2004)	7.16 (6.29-8.15)	6.78 (5.58-8.01)	10.4 (8.19-12.7)	15.6 (13.3-18.9)	20.0 (16.1-29.9)	621
Mexican Americans (2005 - 2006)	6.83 (6.38-7.32)	6.55 (5.94-7.34)	9.40 (8.51-10.6)	13.6 (11.6-15.9)	16.2 (14.3-20.0)	651
Mexican Americans (2007 - 2008)	7.19 (6.39-8.10)	7.07 (6.17-7.76)	9.73 (8.28-11.4)	15.4 (12.9-19.2)	21.3 (17.8-24.3)	513
Mexican Americans (2009 - 2010)	7.04 (6.44-7.69)	6.92 (6.15-7.70)	10.3 (9.19-10.9)	14.7 (13.3-16.2)	18.9 (16.9-20.6)	618
Non-Hispanic blacks (2003 - 2004)	5.08 (4.63-5.56)	4.72 (4.34-5.25)	7.04 (6.23-8.00)	10.7 (8.71-14.3)	15.0 (11.4-19.1)	725
Non-Hispanic blacks (2005 - 2006)	5.08 (4.63-5.57)	4.73 (4.33-5.21)	6.82 (6.13-7.61)	10.6 (8.32-13.5)	15.1 (11.2-25.0)	695
Non-Hispanic blacks (2007 - 2008)	5.19 (4.86-5.55)	4.79 (4.41-5.39)	7.28 (6.97-7.97)	11.2 (10.2-12.2)	14.7 (12.2-18.9)	586
Non-Hispanic blacks (2009 - 2010)	5.58 (5.10-6.10)	5.01 (4.58-5.42)	8.50 (6.94-10.4)	13.6 (12.6-15.5)	19.0 (14.6-23.1)	542
Non-Hispanic whites (2003 - 2004)	6.28 (5.55-7.10)	5.82 (5.19-6.53)	9.10 (7.74-11.4)	14.8 (11.4-18.8)	19.4 (15.8-23.6)	1079
Non-Hispanic whites (2005 - 2006)	6.78 (6.30-7.31)	6.26 (5.79-6.78)	10.2 (8.85-11.4)	16.2 (13.8-18.2)	20.8 (17.9-24.6)	1050
Non-Hispanic whites (2007 - 2008)	6.66 (6.29-7.06)	6.37 (5.73-6.95)	9.64 (8.88-10.2)	14.8 (12.8-16.5)	20.0 (16.5-22.7)	1063
Non-Hispanic whites (2009 - 2010)	6.61 (6.20-7.05)	6.31 (5.76-6.81)	9.44 (8.75-10.0)	14.7 (13.6-15.8)	18.9 (17.0-22.0)	1210

**See [Calculation of Inorganic-related Arsenic Species](#) for additional information.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Inorganic-related Arsenic Species (creatinine corrected) (2011 – 2016)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	6.31 (6.02-6.63)	6.00 (5.64-6.37)	9.46 (8.88-10.1)	15.1 (13.4-16.5)	19.6 (18.3-20.4)	2516
Total population (2013 - 2014)	5.53 (5.24-5.83)	5.28 (4.91-5.61)	8.09 (7.61-8.62)	13.0 (11.9-14.1)	17.4 (15.6-18.8)	2653
Total population (2015 - 2016)	4.94 (4.70-5.20)	4.77 (4.60-5.05)	7.51 (7.29-7.66)	11.6 (10.7-12.5)	16.2 (14.3-17.9)	3091
Age 3-5 years (2015 - 2016)	8.95 (8.20-9.78)	8.52 (7.89-9.27)	12.9 (11.4-14.1)	19.0 (15.4-22.4)	23.7 (21.3-30.4)	506
Age 6-11 years (2011 - 2012)	7.77 (7.36-8.20)	7.33 (6.95-8.26)	10.6 (9.74-11.9)	15.9 (14.3-16.8)	20.2 (16.8-22.3)	401
Age 6-11 years (2013 - 2014)	7.38 (6.78-8.04)	6.73 (5.99-8.30)	10.4 (9.30-12.3)	15.4 (14.1-16.8)	17.8 (15.5-19.4)	397
Age 6-11 years (2015 - 2016)	6.16 (5.78-6.56)	5.92 (5.49-6.27)	8.53 (7.98-9.36)	12.6 (11.2-15.2)	17.7 (14.2-20.7)	380
Age 12-19 years (2011 - 2012)	5.13 (4.48-5.88)	4.76 (4.40-5.11)	7.40 (5.86-8.81)	11.4 (8.17-16.8)	16.8 (11.4-28.7)	392
Age 12-19 years (2013 - 2014)	4.61 (4.14-5.15)	4.38 (3.92-4.81)	6.57 (5.55-7.69)	9.38 (8.11-11.1)	11.7 (9.46-16.7)	450
Age 12-19 years (2015 - 2016)	4.04 (3.78-4.31)	3.96 (3.46-4.43)	5.59 (5.20-6.16)	8.64 (7.50-10.2)	12.9 (9.76-15.3)	402
Age 20+ years (2011 - 2012)	6.37 (6.08-6.67)	6.09 (5.72-6.52)	9.53 (8.98-10.2)	15.6 (13.6-17.0)	19.6 (18.3-20.4)	1723
Age 20+ years (2013 - 2014)	5.51 (5.24-5.79)	5.29 (4.95-5.57)	7.95 (7.61-8.52)	12.9 (11.9-14.2)	17.7 (15.6-19.4)	1806
Age 20+ years (2015 - 2016)	4.84 (4.58-5.13)	4.73 (4.53-4.95)	7.35 (6.99-7.61)	11.2 (10.1-12.3)	16.1 (13.3-18.3)	1803
Males (2011 - 2012)	5.61 (5.24-6.01)	5.27 (4.81-5.87)	8.39 (7.73-9.04)	12.4 (10.6-13.9)	16.8 (13.6-19.1)	1263
Males (2013 - 2014)	5.02 (4.79-5.26)	4.72 (4.44-5.04)	7.04 (6.66-7.54)	11.4 (10.7-12.8)	17.0 (14.2-17.8)	1307
Males (2015 - 2016)	4.42 (4.12-4.75)	4.42 (3.94-4.77)	6.46 (6.15-6.99)	10.1 (9.18-11.1)	13.7 (11.8-16.8)	1537
Females (2011 - 2012)	7.06 (6.69-7.45)	6.77 (6.30-7.15)	11.0 (10.2-11.9)	16.8 (15.3-19.1)	21.5 (19.4-24.2)	1253
Females (2013 - 2014)	6.06 (5.62-6.54)	5.80 (5.33-6.46)	9.14 (8.21-10.1)	13.9 (12.5-15.5)	18.0 (15.9-19.5)	1346
Females (2015 - 2016)	5.49 (5.23-5.77)	5.20 (4.93-5.61)	8.33 (7.92-8.53)	12.8 (11.9-14.2)	17.3 (15.5-20.4)	1554
Mexican Americans (2011 - 2012)	6.48 (6.05-6.94)	6.33 (5.77-6.82)	9.18 (7.97-9.86)	12.4 (11.2-13.3)	16.0 (13.0-19.0)	317
Mexican Americans (2013 - 2014)	5.71 (5.39-6.06)	5.52 (5.15-5.87)	7.61 (6.97-8.52)	10.9 (9.87-12.4)	13.9 (12.2-15.8)	455
Mexican Americans (2015 - 2016)	5.14 (4.66-5.67)	5.06 (4.44-5.70)	7.51 (6.87-8.16)	10.7 (9.58-11.6)	13.4 (11.8-15.1)	590
Non-Hispanic blacks (2011 - 2012)	4.83 (4.23-5.53)	4.53 (3.92-5.26)	7.30 (6.09-8.27)	10.9 (9.40-13.2)	16.2 (12.6-17.3)	672
Non-Hispanic blacks (2013 - 2014)	4.21 (3.77-4.72)	4.00 (3.42-4.75)	6.13 (5.48-6.97)	8.70 (7.90-10.5)	12.2 (9.92-15.4)	576
Non-Hispanic blacks (2015 - 2016)	4.02 (3.60-4.49)	3.87 (3.40-4.46)	6.15 (5.33-6.79)	9.63 (7.89-12.2)	13.7 (11.8-16.3)	676
Non-Hispanic whites (2011 - 2012)	6.13 (5.77-6.50)	5.81 (5.27-6.36)	9.09 (8.41-9.86)	14.3 (12.4-16.2)	18.6 (16.2-19.8)	824
Non-Hispanic whites (2013 - 2014)	5.36 (4.99-5.76)	5.14 (4.65-5.55)	7.69 (7.04-8.64)	12.5 (11.1-13.9)	16.0 (14.1-18.3)	979
Non-Hispanic whites (2015 - 2016)	4.64 (4.39-4.90)	4.65 (4.49-4.84)	6.87 (6.38-7.35)	9.71 (9.07-10.7)	12.5 (11.2-15.5)	937
All Hispanics (2011 - 2012)	6.96 (6.56-7.38)	6.90 (6.45-7.36)	9.80 (9.30-10.5)	13.4 (12.0-15.9)	17.2 (14.7-20.3)	574
All Hispanics (2013 - 2014)	5.93 (5.59-6.28)	5.76 (5.43-6.09)	8.05 (7.53-8.71)	11.9 (10.5-13.0)	15.2 (12.4-19.0)	703
All Hispanics (2015 - 2016)	5.64 (5.24-6.07)	5.51 (5.06-5.86)	8.31 (7.93-8.80)	12.5 (11.5-13.4)	16.4 (14.2-17.8)	991
Asians (2011 - 2012)	13.6 (11.9-15.4)	13.2 (11.4-14.6)	20.8 (16.5-24.6)	33.9 (24.6-58.3)	58.8 (36.4-71.5)	356
Asians (2013 - 2014)	11.8 (10.6-13.2)	11.2 (10.0-12.8)	18.6 (14.7-21.7)	30.3 (23.9-40.3)	44.5 (31.2-48.9)	291
Asians (2015 - 2016)	11.1 (9.71-12.6)	11.1 (9.54-12.8)	17.8 (15.2-22.0)	29.6 (24.5-34.3)	34.9 (30.2-36.7)	334

**See [Calculation of Inorganic-related Arsenic Species](#) for additional information.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenic (V) acid (2003 – 2010)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	1.10 (<LOD-1.50)	2568
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	1.06 (<LOD-1.43)	2588
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2852
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	1.10 (<LOD-1.30)	292
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	354
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	379
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.60)	728
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.00 (<LOD-1.30)	703
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	453
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	1.10 (<LOD-1.50)	1548
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.09 (<LOD-1.71)	1531
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1820
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2020
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.50)	1284
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	1.14 (<LOD-1.71)	1276
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1396
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	1.10 (<LOD-1.30)	1284
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	1.01 (<LOD-1.22)	1312
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1456
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.60)	621
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	651
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	513
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.80)	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	543
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	1.10 (<LOD-1.50)	1078
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	1.10 (<LOD-1.74)	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1210

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 1.0, 1.0, 1.0, and 1.0 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenic (V) acid (2011 – 2016)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2517
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2654
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3094
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	< LOD	.820 (<LOD-1.12)	507
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	401
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	397
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	380
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	392
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	450
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	402
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1724
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1807
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1805
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1264
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1308
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1537
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1253
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1346
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1557
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	317
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	455
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	591
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	672
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	576
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	678
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	825
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	980
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	937
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	574
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	703
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	992
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	356
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	291
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	334

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.87, 0.79, and 0.79, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenic (V) acid (creatinine corrected) (2003 – 2010)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	3.04 (<LOD-3.50)	2568
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	3.23 (<LOD-3.55)	2588
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2851
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	2.80 (<LOD-4.00)	292
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	354
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	378
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	1.75 (<LOD-2.41)	728
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.69 (<LOD-2.73)	703
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	453
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	3.18 (<LOD-3.70)	1548
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	3.38 (<LOD-3.94)	1531
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1820
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2020
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	2.61 (<LOD-3.18)	1284
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	2.14 (<LOD-2.73)	1276
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1395
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	3.33 (<LOD-3.89)	1284
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	3.55 (<LOD-4.44)	1312
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1456
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	2.69 (<LOD-3.50)	621
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	651
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	513
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	1.75 (<LOD-2.19)	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	542
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	3.33 (<LOD-3.95)	1078
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	3.38 (<LOD-3.80)	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1210

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenic (V) acid (creatinine corrected) (2011 – 2016)

CAS Number 7440-38-2

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2516
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2653
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3091
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	< LOD	5.09 (<LOD-5.60)	506
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	401
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	397
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	380
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	392
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	450
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	402
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1723
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1806
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1803
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1263
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1307
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1537
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1253
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1346
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1554
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	317
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	455
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	590
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	672
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	576
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	676
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	824
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	979
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	937
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	574
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	703
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	991
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	356
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	291
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	334

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenobetaine (2003 – 2010)

CAS Number 64436-13-1

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	1.55 (1.31-1.83)	1.00 (.800-1.40)	5.20 (4.00-6.50)	16.8 (12.7-22.3)	35.0 (27.6-44.6)	2568
Total population (2005 - 2006)	1.86 (1.43-2.41)	1.53 (.980-2.26)	6.73 (4.80-8.91)	22.6 (16.5-30.3)	40.6 (30.7-59.4)	2588
Total population (2007 - 2008)	*	.670 (.510-.910)	4.26 (3.53-4.88)	16.6 (12.5-20.2)	29.5 (22.8-37.1)	2576
Total population (2009 - 2010)	1.59 (1.38-1.83)	.940 (.720-1.26)	6.18 (4.67-7.87)	23.5 (19.8-30.1)	50.4 (35.7-63.2)	2870
Age 6-11 years (2003 - 2004)	*	< LOD	1.80 (.800-4.00)	8.80 (3.90-29.9)	29.9 (6.20-190)	292
Age 6-11 years (2005 - 2006)	*	< LOD	2.22 (.620-5.35)	7.14 (2.34-29.9)	18.9 (5.46-45.0)	354
Age 6-11 years (2007 - 2008)	*	< LOD	1.24 (.780-2.42)	6.71 (3.37-8.38)	13.0 (7.22-25.2)	390
Age 6-11 years (2009 - 2010)	*	< LOD	1.20 (.590-3.12)	7.98 (5.20-15.7)	19.4 (9.25-47.9)	380
Age 12-19 years (2003 - 2004)	*	.600 (.400-.800)	3.20 (2.00-4.70)	13.9 (7.20-25.1)	31.8 (17.2-35.8)	728
Age 12-19 years (2005 - 2006)	*	.550 (<LOD-1.14)	3.76 (1.95-7.16)	12.4 (9.15-20.4)	25.6 (16.4-32.4)	703
Age 12-19 years (2007 - 2008)	*	< LOD	1.72 (.780-2.62)	4.88 (3.49-9.17)	10.4 (6.81-23.6)	366
Age 12-19 years (2009 - 2010)	*	< LOD	2.07 (1.26-3.60)	11.0 (5.35-16.7)	17.8 (12.8-24.0)	455
Age 20+ years (2003 - 2004)	1.74 (1.48-2.05)	1.30 (1.00-1.60)	6.10 (4.90-7.10)	18.5 (14.0-23.5)	35.5 (26.8-50.5)	1548
Age 20+ years (2005 - 2006)	2.20 (1.71-2.84)	1.89 (1.41-2.64)	8.14 (5.86-10.4)	27.6 (18.7-35.7)	43.9 (36.0-67.9)	1531
Age 20+ years (2007 - 2008)	1.46 (1.28-1.67)	.960 (.750-1.22)	5.08 (4.30-6.20)	19.1 (14.3-23.7)	31.7 (23.9-46.1)	1820
Age 20+ years (2009 - 2010)	1.92 (1.63-2.26)	1.33 (.960-1.91)	7.60 (6.06-9.90)	28.2 (21.9-34.9)	59.5 (45.7-76.7)	2035
Males (2003 - 2004)	1.66 (1.43-1.93)	1.20 (.900-1.50)	5.80 (4.40-7.10)	18.6 (13.9-23.7)	35.0 (26.8-40.5)	1284
Males (2005 - 2006)	1.83 (1.40-2.40)	1.44 (.920-2.04)	6.63 (5.06-8.66)	23.2 (12.8-33.4)	37.1 (28.5-51.3)	1276
Males (2007 - 2008)	*	.910 (.660-1.26)	5.07 (4.01-6.81)	19.1 (13.8-22.6)	30.3 (22.8-46.1)	1289
Males (2009 - 2010)	1.71 (1.48-1.97)	.990 (.780-1.33)	7.14 (5.38-9.86)	26.8 (21.5-31.8)	57.4 (36.4-64.6)	1402
Females (2003 - 2004)	1.45 (1.17-1.80)	.900 (.700-1.40)	4.70 (3.40-6.20)	15.6 (11.1-25.3)	32.7 (21.1-51.3)	1284
Females (2005 - 2006)	1.88 (1.42-2.50)	1.64 (.950-2.51)	6.81 (4.03-9.88)	21.8 (17.3-30.1)	43.3 (33.8-67.9)	1312
Females (2007 - 2008)	*	.530 (.410-.650)	3.52 (2.94-4.35)	14.0 (10.9-17.5)	29.5 (19.4-34.0)	1287
Females (2009 - 2010)	1.49 (1.20-1.84)	.890 (.590-1.35)	5.54 (3.56-7.74)	21.2 (14.7-32.7)	47.1 (32.5-76.4)	1468
Mexican Americans (2003 - 2004)	1.19 (.871-1.62)	.800 (.500-1.30)	3.20 (1.80-5.20)	10.2 (6.70-21.4)	31.4 (16.3-39.1)	621
Mexican Americans (2005 - 2006)	1.44 (1.23-1.69)	1.04 (.770-1.35)	3.90 (3.03-5.06)	16.8 (11.1-32.0)	41.4 (23.4-57.9)	651
Mexican Americans (2007 - 2008)	*	.560 (<LOD-.910)	3.27 (2.00-5.65)	16.9 (9.73-20.8)	29.6 (19.3-40.5)	513
Mexican Americans (2009 - 2010)	*	.640 (.440-.800)	3.58 (1.80-5.89)	15.5 (7.83-24.6)	31.9 (18.7-44.7)	617
Non-Hispanic blacks (2003 - 2004)	2.29 (1.60-3.28)	2.00 (1.20-3.50)	7.70 (5.00-12.0)	23.7 (13.2-38.7)	45.6 (25.1-94.0)	725
Non-Hispanic blacks (2005 - 2006)	2.55 (1.64-3.99)	2.42 (1.15-4.58)	8.74 (6.01-14.4)	23.8 (15.9-48.9)	59.6 (30.5-121)	695
Non-Hispanic blacks (2007 - 2008)	1.58 (1.31-1.90)	1.11 (.750-1.60)	5.88 (4.12-8.13)	21.9 (16.4-24.9)	35.9 (25.4-47.7)	586
Non-Hispanic blacks (2009 - 2010)	1.99 (1.60-2.47)	1.79 (1.05-2.41)	7.61 (5.34-10.0)	25.5 (15.4-37.6)	51.2 (31.0-90.9)	546
Non-Hispanic whites (2003 - 2004)	1.37 (1.11-1.68)	.800 (.700-1.20)	4.30 (2.50-6.30)	13.3 (9.70-21.4)	29.3 (21.4-35.5)	1078
Non-Hispanic whites (2005 - 2006)	1.74 (1.27-2.40)	1.41 (.750-2.27)	6.40 (3.93-9.04)	22.4 (14.1-30.1)	38.4 (27.8-66.8)	1050
Non-Hispanic whites (2007 - 2008)	*	.530 (<LOD-.780)	3.63 (3.06-4.38)	12.6 (9.08-17.1)	24.3 (17.6-30.3)	1063
Non-Hispanic whites (2009 - 2010)	1.43 (1.24-1.65)	.800 (.610-1.18)	5.40 (3.77-7.27)	20.6 (17.7-24.5)	41.3 (30.6-59.5)	1226

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.4, 0.4, 0.4, and 0.4 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenobetaine (2011 – 2016)

CAS Number 64436-13-1

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	4.62 (3.25-6.25)	18.0 (13.7-23.2)	36.5 (25.7-51.9)	2517
Total population (2013 - 2014)	*	< LOD	3.70 (2.77-5.00)	15.1 (12.4-19.6)	30.5 (24.2-39.7)	2654
Total population (2015 - 2016)	*	< LOD	3.44 (2.77-4.44)	14.6 (10.9-18.1)	27.6 (22.1-38.6)	3094
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	2.87 (1.95-7.01)	10.1 (2.96-22.0)	507
Age 6-11 years (2011 - 2012)	*	< LOD	1.58 (<LOD-4.12)	15.2 (6.60-35.6)	49.6 (20.0-60.1)	401
Age 6-11 years (2013 - 2014)	*	< LOD	1.45 (<LOD-2.03)	5.63 (2.82-10.8)	11.7 (6.29-30.8)	397
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	5.52 (2.57-7.33)	13.0 (5.54-22.3)	380
Age 12-19 years (2011 - 2012)	*	< LOD	1.82 (<LOD-8.46)	17.6 (6.92-26.5)	32.6 (15.3-100)	392
Age 12-19 years (2013 - 2014)	*	< LOD	1.55 (<LOD-2.76)	11.6 (7.52-16.2)	29.8 (13.0-77.9)	450
Age 12-19 years (2015 - 2016)	*	< LOD	1.58 (<LOD-2.94)	7.27 (5.48-9.32)	13.1 (7.70-21.3)	402
Age 20+ years (2011 - 2012)	*	< LOD	5.26 (4.07-6.58)	18.1 (13.4-24.0)	36.5 (24.4-53.4)	1724
Age 20+ years (2013 - 2014)	*	< LOD	4.35 (3.13-6.09)	17.8 (13.6-21.2)	34.0 (24.5-41.5)	1807
Age 20+ years (2015 - 2016)	*	< LOD	4.22 (3.26-5.70)	17.3 (12.6-21.8)	33.9 (24.2-41.9)	1805
Males (2011 - 2012)	*	< LOD	5.22 (3.38-7.16)	18.4 (13.7-25.9)	41.7 (26.4-60.3)	1264
Males (2013 - 2014)	*	< LOD	3.88 (2.95-5.17)	14.7 (10.3-20.6)	30.0 (20.7-41.8)	1308
Males (2015 - 2016)	*	< LOD	3.66 (2.95-4.86)	16.1 (10.6-20.5)	30.8 (20.9-48.2)	1537
Females (2011 - 2012)	*	< LOD	4.18 (2.84-6.11)	17.0 (10.6-22.7)	33.5 (22.1-53.1)	1253
Females (2013 - 2014)	*	< LOD	3.53 (2.37-4.95)	16.0 (12.4-21.2)	33.2 (24.3-45.4)	1346
Females (2015 - 2016)	*	< LOD	2.94 (2.00-4.69)	12.5 (7.51-19.0)	26.0 (19.9-35.2)	1557
Mexican Americans (2011 - 2012)	*	< LOD	3.78 (1.93-5.84)	12.5 (6.11-17.6)	19.3 (12.9-34.7)	317
Mexican Americans (2013 - 2014)	*	< LOD	1.85 (<LOD-2.66)	7.45 (2.97-21.7)	21.3 (7.45-45.8)	455
Mexican Americans (2015 - 2016)	*	< LOD	1.96 (1.34-2.75)	7.72 (4.70-10.2)	17.5 (8.53-44.7)	591
Non-Hispanic blacks (2011 - 2012)	*	1.19 (<LOD-2.91)	7.09 (3.79-13.4)	30.2 (17.2-51.9)	57.9 (36.1-81.5)	672
Non-Hispanic blacks (2013 - 2014)	*	1.25 (<LOD-1.71)	5.04 (3.56-8.35)	21.2 (15.2-26.4)	36.4 (26.4-70.9)	576
Non-Hispanic blacks (2015 - 2016)	*	1.30 (<LOD-1.85)	6.25 (3.88-10.4)	22.4 (14.4-27.6)	44.4 (23.9-89.0)	678
Non-Hispanic whites (2011 - 2012)	*	< LOD	4.07 (2.39-6.12)	16.7 (9.30-22.5)	30.0 (23.2-47.0)	825
Non-Hispanic whites (2013 - 2014)	*	< LOD	3.33 (2.30-5.12)	14.0 (8.82-20.8)	29.4 (20.7-39.7)	980
Non-Hispanic whites (2015 - 2016)	*	< LOD	2.88 (2.15-4.07)	12.0 (7.38-16.0)	23.2 (15.0-35.2)	937
All Hispanics (2011 - 2012)	*	< LOD	3.78 (2.65-4.73)	12.2 (7.70-16.8)	19.3 (13.9-37.4)	574
All Hispanics (2013 - 2014)	*	< LOD	2.30 (1.85-2.81)	9.56 (5.03-14.9)	21.3 (12.0-33.2)	703
All Hispanics (2015 - 2016)	*	< LOD	2.52 (1.86-3.66)	10.5 (7.58-17.5)	26.5 (17.0-50.8)	992
Asians (2011 - 2012)	5.15 (4.31-6.14)	4.80 (3.76-5.82)	17.3 (13.2-21.3)	46.1 (29.1-74.1)	85.6 (51.8-110)	356
Asians (2013 - 2014)	3.74 (3.04-4.60)	2.31 (1.35-4.24)	11.6 (8.96-17.4)	42.1 (27.3-60.7)	79.5 (48.4-123)	291
Asians (2015 - 2016)	4.18 (3.08-5.67)	3.37 (2.09-5.71)	14.6 (8.35-21.8)	35.4 (24.6-62.8)	64.8 (42.3-86.2)	334

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 1.19, 1.16, and 1.16, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenobetaine (creatinine corrected) (2003 – 2010)

CAS Number 64436-13-1

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	1.54 (1.30-1.82)	1.16 (.959-1.43)	5.00 (3.62-6.91)	16.2 (12.5-20.3)	29.4 (24.0-36.4)	2568
Total population (2005 - 2006)	1.82 (1.40-2.37)	1.64 (1.10-2.41)	6.64 (4.48-8.79)	20.3 (14.5-28.1)	37.0 (27.5-58.3)	2588
Total population (2007 - 2008)	*	1.00 (.850-1.18)	4.07 (3.36-4.98)	14.7 (11.1-17.8)	27.7 (18.9-45.4)	2576
Total population (2009 - 2010)	1.69 (1.45-1.97)	1.23 (.980-1.47)	6.48 (4.90-8.00)	23.6 (18.5-30.7)	49.6 (36.6-61.3)	2869
Age 6-11 years (2003 - 2004)	*	< LOD	2.00 (1.15-4.83)	12.2 (4.13-39.7)	29.6 (6.80-153)	292
Age 6-11 years (2005 - 2006)	*	< LOD	2.88 (1.04-6.25)	8.77 (2.88-40.5)	23.6 (6.86-74.8)	354
Age 6-11 years (2007 - 2008)	*	< LOD	2.11 (1.27-3.79)	8.98 (4.76-14.8)	16.4 (8.98-23.8)	390
Age 6-11 years (2009 - 2010)	*	< LOD	1.70 (1.21-3.02)	9.52 (5.08-20.7)	24.9 (9.81-50.7)	379
Age 12-19 years (2003 - 2004)	*	.531 (.400-.638)	2.14 (1.39-3.51)	9.29 (4.29-14.7)	17.3 (10.4-28.7)	728
Age 12-19 years (2005 - 2006)	*	.620 (<LOD-.800)	2.82 (1.58-4.77)	10.5 (7.03-13.7)	15.4 (11.8-22.3)	703
Age 12-19 years (2007 - 2008)	*	< LOD	1.28 (.650-1.72)	5.17 (2.31-6.53)	9.88 (5.72-16.0)	366
Age 12-19 years (2009 - 2010)	*	< LOD	2.25 (1.17-3.76)	8.69 (5.03-12.8)	14.0 (9.82-15.5)	455
Age 20+ years (2003 - 2004)	1.79 (1.51-2.12)	1.47 (1.15-1.88)	5.91 (4.32-7.72)	17.2 (13.4-21.8)	30.1 (26.1-36.4)	1548
Age 20+ years (2005 - 2006)	2.19 (1.70-2.82)	2.13 (1.40-2.83)	7.79 (5.38-10.2)	24.4 (16.6-32.9)	43.1 (30.5-71.4)	1531
Age 20+ years (2007 - 2008)	1.55 (1.36-1.78)	1.29 (1.13-1.52)	5.27 (3.91-6.40)	16.6 (12.2-21.6)	33.4 (21.0-55.9)	1820
Age 20+ years (2009 - 2010)	2.03 (1.70-2.42)	1.52 (1.18-2.16)	7.65 (6.04-10.4)	27.7 (22.1-35.9)	57.0 (39.7-71.9)	2035
Males (2003 - 2004)	1.40 (1.18-1.67)	1.11 (.909-1.28)	4.78 (3.61-6.70)	14.4 (11.1-18.5)	26.5 (18.6-29.9)	1284
Males (2005 - 2006)	1.50 (1.15-1.96)	1.25 (.800-1.93)	5.11 (3.41-7.54)	15.3 (11.2-20.8)	30.5 (19.6-44.0)	1276
Males (2007 - 2008)	*	1.04 (.870-1.25)	4.11 (3.16-5.30)	14.9 (10.1-17.9)	27.0 (17.8-49.2)	1289
Males (2009 - 2010)	1.56 (1.35-1.80)	1.04 (.880-1.34)	6.20 (4.34-7.79)	23.4 (18.7-27.6)	39.2 (32.0-54.8)	1401
Females (2003 - 2004)	1.68 (1.37-2.05)	1.25 (.938-1.67)	5.58 (3.50-7.43)	17.2 (12.3-24.5)	32.9 (25.6-46.3)	1284
Females (2005 - 2006)	2.20 (1.65-2.93)	2.04 (1.30-2.92)	7.86 (5.38-10.8)	26.4 (16.6-35.6)	46.2 (30.3-74.3)	1312
Females (2007 - 2008)	*	.980 (.800-1.18)	4.06 (3.35-5.29)	14.6 (11.1-17.8)	29.6 (18.2-50.0)	1287
Females (2009 - 2010)	1.83 (1.48-2.26)	1.36 (1.04-1.75)	6.65 (4.68-9.21)	24.1 (16.5-37.3)	57.0 (36.3-71.3)	1468
Mexican Americans (2003 - 2004)	1.10 (.786-1.55)	.877 (.612-1.40)	2.93 (1.78-5.21)	8.88 (5.50-15.4)	19.0 (9.64-29.4)	621
Mexican Americans (2005 - 2006)	1.35 (1.13-1.62)	.970 (.810-1.19)	4.21 (2.79-5.68)	16.6 (10.5-21.3)	36.9 (18.4-69.5)	651
Mexican Americans (2007 - 2008)	*	.780 (<LOD-1.21)	3.04 (1.99-5.09)	13.7 (9.09-16.7)	28.9 (16.2-46.7)	513
Mexican Americans (2009 - 2010)	*	.790 (.670-.940)	3.64 (2.28-4.41)	13.5 (7.78-19.1)	26.8 (16.5-42.0)	617
Non-Hispanic blacks (2003 - 2004)	1.65 (1.19-2.30)	1.53 (.901-2.45)	5.81 (4.25-7.82)	13.6 (9.76-27.9)	32.9 (13.4-82.1)	725
Non-Hispanic blacks (2005 - 2006)	1.84 (1.20-2.83)	1.71 (.910-2.95)	6.07 (3.83-9.25)	19.4 (10.4-45.2)	47.5 (25.3-62.0)	695
Non-Hispanic blacks (2007 - 2008)	1.16 (.955-1.41)	.830 (.620-1.12)	4.44 (3.23-6.58)	14.9 (10.5-17.6)	25.1 (17.4-40.0)	586
Non-Hispanic blacks (2009 - 2010)	1.59 (1.29-1.96)	1.30 (.850-2.04)	5.92 (4.20-8.40)	19.5 (13.5-27.1)	37.9 (26.1-51.7)	545
Non-Hispanic whites (2003 - 2004)	1.44 (1.15-1.80)	1.05 (.833-1.36)	4.47 (2.73-6.83)	14.3 (10.9-18.6)	26.5 (18.6-32.0)	1078
Non-Hispanic whites (2005 - 2006)	1.81 (1.32-2.47)	1.65 (.970-2.55)	6.65 (3.95-9.34)	19.7 (12.6-30.5)	36.6 (25.1-71.4)	1050
Non-Hispanic whites (2007 - 2008)	*	.970 (<LOD-1.18)	3.56 (2.93-4.53)	11.6 (8.98-16.6)	23.8 (15.5-41.7)	1063
Non-Hispanic whites (2009 - 2010)	1.60 (1.36-1.87)	1.15 (.900-1.43)	5.85 (4.33-7.65)	22.8 (15.6-29.4)	38.5 (32.0-57.0)	1226

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenobetaine (creatinine corrected) (2011 – 2016)

CAS Number 64436-13-1

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	5.63 (4.42-7.22)	18.0 (13.8-26.1)	36.9 (26.9-45.6)	2516
Total population (2013 - 2014)	*	< LOD	4.91 (3.98-6.31)	16.3 (12.7-21.2)	38.7 (33.3-46.8)	2653
Total population (2015 - 2016)	*	< LOD	4.55 (3.73-5.29)	13.7 (10.3-18.4)	29.0 (20.2-46.7)	3091
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	9.54 (6.31-13.3)	20.5 (10.9-34.6)	506
Age 6-11 years (2011 - 2012)	*	< LOD	4.35 (<LOD-6.46)	16.0 (8.00-39.5)	69.0 (16.0-102)	401
Age 6-11 years (2013 - 2014)	*	< LOD	3.57 (<LOD-5.38)	9.00 (6.77-11.1)	12.6 (10.1-28.6)	397
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	6.88 (4.74-9.92)	17.1 (7.97-20.5)	380
Age 12-19 years (2011 - 2012)	*	< LOD	3.36 (<LOD-8.94)	14.4 (5.56-23.8)	25.9 (13.6-104)	392
Age 12-19 years (2013 - 2014)	*	< LOD	2.28 (<LOD-3.15)	9.59 (4.56-16.5)	19.7 (12.2-46.9)	450
Age 12-19 years (2015 - 2016)	*	< LOD	2.24 (<LOD-3.11)	6.80 (4.45-9.81)	12.3 (8.16-19.5)	402
Age 20+ years (2011 - 2012)	*	< LOD	6.25 (4.78-8.46)	19.3 (14.0-28.4)	35.8 (26.8-44.1)	1723
Age 20+ years (2013 - 2014)	*	< LOD	5.63 (4.54-7.37)	17.8 (14.2-25.2)	44.9 (35.5-52.1)	1806
Age 20+ years (2015 - 2016)	*	< LOD	5.08 (4.10-6.18)	16.4 (12.0-21.6)	36.6 (24.6-60.9)	1803
Males (2011 - 2012)	*	< LOD	4.94 (3.50-6.67)	16.7 (12.6-25.7)	35.7 (23.4-52.8)	1263
Males (2013 - 2014)	*	< LOD	4.42 (3.42-5.97)	14.5 (10.7-20.1)	37.8 (24.1-47.7)	1307
Males (2015 - 2016)	*	< LOD	4.32 (3.43-5.38)	12.5 (9.69-18.2)	27.0 (18.4-42.3)	1537
Females (2011 - 2012)	*	< LOD	6.48 (4.79-8.60)	18.8 (15.4-28.1)	37.0 (26.2-46.8)	1253
Females (2013 - 2014)	*	< LOD	5.39 (4.56-7.07)	17.8 (13.8-25.8)	41.3 (33.3-53.2)	1346
Females (2015 - 2016)	*	< LOD	4.57 (3.57-5.85)	15.4 (9.53-20.9)	31.8 (18.5-58.3)	1554
Mexican Americans (2011 - 2012)	*	< LOD	3.87 (2.80-5.76)	12.6 (8.36-22.6)	25.9 (13.4-40.3)	317
Mexican Americans (2013 - 2014)	*	< LOD	2.93 (<LOD-4.10)	7.28 (4.10-14.4)	16.6 (6.84-41.5)	455
Mexican Americans (2015 - 2016)	*	< LOD	3.08 (2.46-3.91)	8.77 (5.47-12.7)	17.4 (9.05-32.2)	590
Non-Hispanic blacks (2011 - 2012)	*	1.50 (<LOD-2.18)	6.00 (2.63-12.4)	20.3 (12.8-30.0)	38.7 (22.6-78.2)	672
Non-Hispanic blacks (2013 - 2014)	*	1.30 (<LOD-1.56)	4.39 (3.28-6.05)	13.7 (10.4-19.3)	29.2 (16.8-60.0)	576
Non-Hispanic blacks (2015 - 2016)	*	1.49 (<LOD-2.00)	4.71 (3.25-7.38)	16.0 (12.0-20.5)	29.3 (17.8-66.4)	676
Non-Hispanic whites (2011 - 2012)	*	< LOD	5.00 (4.06-7.55)	16.8 (12.7-28.7)	35.7 (21.0-45.6)	824
Non-Hispanic whites (2013 - 2014)	*	< LOD	5.08 (3.73-7.46)	16.4 (11.9-24.4)	39.2 (29.3-47.7)	979
Non-Hispanic whites (2015 - 2016)	*	< LOD	4.10 (3.28-5.06)	10.7 (7.70-17.5)	26.7 (15.4-51.3)	937
All Hispanics (2011 - 2012)	*	< LOD	4.00 (3.48-4.75)	13.5 (9.17-17.1)	24.9 (16.6-30.9)	574
All Hispanics (2013 - 2014)	*	< LOD	3.28 (2.56-4.24)	7.95 (5.80-13.7)	17.2 (9.76-29.2)	703
All Hispanics (2015 - 2016)	*	< LOD	3.70 (3.15-4.30)	12.8 (8.63-17.7)	28.5 (17.6-36.5)	991
Asians (2011 - 2012)	6.90 (5.54-8.60)	6.02 (4.78-7.88)	21.5 (14.0-30.7)	60.4 (42.8-82.0)	95.7 (75.6-120)	356
Asians (2013 - 2014)	5.83 (4.56-7.44)	4.08 (3.42-6.68)	17.4 (12.3-28.7)	71.3 (46.4-81.5)	89.3 (80.4-159)	291
Asians (2015 - 2016)	5.68 (4.16-7.76)	5.05 (3.07-9.55)	18.2 (12.6-26.0)	44.8 (35.4-58.5)	81.3 (46.6-129)	334

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenocholine (2003 – 2010)

CAS Number 96055-45-7

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2568
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2588
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2871
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	292
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	354
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	380
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	728
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	703
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	456
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1548
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1531
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1820
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2035
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1276
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1403
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1312
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1468
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	621
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	651
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	513
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	546
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1078
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1226

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.6, 0.6, 0.6, and 0.6 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenocholine (2011 – 2016)

CAS Number 96055-45-7

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2517
Total population (2013 - 2014)	*	< LOD	< LOD	.200 (.140-.250)	.320 (.290-.350)	2654
Total population (2015 - 2016)	*	< LOD	< LOD	.220 (<LOD-.400)	.440 (.290-.570)	3094
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	.180 (<LOD-.480)	.410 (<LOD-.630)	507
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	401
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.260 (<LOD-.750)	397
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	.180 (<LOD-.330)	.380 (.130-.550)	380
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	392
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.160 (<LOD-.260)	.260 (.140-.370)	450
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	.210 (<LOD-.520)	.430 (.150-.780)	402
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1724
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.210 (.150-.260)	.330 (.290-.370)	1807
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	.230 (<LOD-.390)	.440 (.310-.600)	1805
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1264
Males (2013 - 2014)	*	< LOD	< LOD	.220 (.130-.290)	.340 (.290-.380)	1308
Males (2015 - 2016)	*	< LOD	< LOD	.260 (.110-.470)	.470 (.330-.680)	1537
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1253
Females (2013 - 2014)	*	< LOD	< LOD	.180 (.110-.230)	.290 (.220-.360)	1346
Females (2015 - 2016)	*	< LOD	< LOD	.200 (<LOD-.340)	.380 (.240-.520)	1557
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	317
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.180 (<LOD-.260)	.320 (.220-.390)	455
Mexican Americans (2015 - 2016)	*	< LOD	.120 (<LOD-.300)	.380 (.190-.560)	.550 (.420-.650)	591
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	672
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.260 (.200-.310)	.370 (.310-.410)	576
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	.330 (.160-.690)	.690 (.330-1.09)	678
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	825
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.160 (<LOD-.250)	.280 (.200-.360)	980
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	.160 (<LOD-.380)	.370 (.150-.550)	937
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	574
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.180 (<LOD-.270)	.330 (.250-.390)	703
All Hispanics (2015 - 2016)	*	< LOD	< LOD	.350 (.170-.520)	.520 (.410-.610)	992
Asians (2011 - 2012)	*	< LOD	< LOD	.310 (<LOD-.450)	.560 (.370-.930)	356
Asians (2013 - 2014)	*	< LOD	.130 (<LOD-.230)	.430 (.340-.570)	.860 (.480-1.83)	291
Asians (2015 - 2016)	*	< LOD	< LOD	.360 (.210-.580)	.580 (.310-.990)	334

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.28, 0.11, and 0.11, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenocholine (creatinine corrected) (2003 – 2010)

CAS Number 96055-45-7

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2568
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2588
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2870
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	292
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	354
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	379
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	728
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	703
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	456
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1548
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1531
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1820
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2035
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1276
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1402
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1312
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1468
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	621
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	651
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	513
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	545
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1078
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1226

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenocholine (creatinine corrected) (2011 – 2016)

CAS Number 96055-45-7

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2516
Total population (2013 - 2014)	*	< LOD	< LOD	.333 (.296-.381)	.533 (.444-.615)	2653
Total population (2015 - 2016)	*	< LOD	< LOD	.348 (<LOD-.430)	.533 (.413-.672)	3091
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	.788 (<LOD-1.14)	1.06 (<LOD-2.00)	506
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	401
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.533 (<LOD-.974)	397
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	.400 (<LOD-.500)	.571 (.392-.889)	380
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	392
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.229 (<LOD-.276)	.308 (.250-.348)	450
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	.267 (<LOD-.421)	.421 (.250-.889)	402
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1723
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.351 (.314-.400)	.571 (.471-.667)	1806
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	.333 (<LOD-.414)	.533 (.402-.638)	1803
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1263
Males (2013 - 2014)	*	< LOD	< LOD	.276 (.250-.320)	.526 (.338-.603)	1307
Males (2015 - 2016)	*	< LOD	< LOD	.302 (.239-.412)	.495 (.348-.677)	1537
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1253
Females (2013 - 2014)	*	< LOD	< LOD	.381 (.333-.444)	.533 (.471-.667)	1346
Females (2015 - 2016)	*	< LOD	< LOD	.393 (<LOD-.444)	.595 (.444-.672)	1554
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	317
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.276 (<LOD-.308)	.348 (.286-.490)	455
Mexican Americans (2015 - 2016)	*	< LOD	.218 (<LOD-.316)	.400 (.276-.624)	.624 (.468-.872)	590
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	672
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.235 (.190-.259)	.316 (.259-.364)	576
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	.308 (.237-.400)	.429 (.318-.800)	676
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	824
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.364 (<LOD-.444)	.571 (.444-.667)	979
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	.333 (<LOD-.421)	.471 (.378-.667)	937
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	574
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.283 (<LOD-.320)	.364 (.308-.444)	703
All Hispanics (2015 - 2016)	*	< LOD	< LOD	.421 (.308-.597)	.633 (.500-.857)	991
Asians (2011 - 2012)	*	< LOD	< LOD	.952 (<LOD-1.33)	1.43 (.952-2.00)	356
Asians (2013 - 2014)	*	< LOD	.333 (<LOD-.421)	.727 (.485-1.14)	1.25 (.800-4.25)	291
Asians (2015 - 2016)	*	< LOD	< LOD	.528 (.431-.622)	.721 (.528-1.16)	334

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenous (III) acid (2003 – 2010)

CAS Number 13464-58-9

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2568
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2588
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2871
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	292
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	354
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	380
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	1.40 (<LOD-1.70)	728
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.40)	703
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	456
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1548
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1531
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1820
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2035
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	1.26 (<LOD-1.73)	1276
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	1.24 (<LOD-1.50)	1403
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1312
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1468
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	2.00 (<LOD-3.00)	621
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	651
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.76)	513
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.80)	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	546
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1078
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1226

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 1.2, 1.2, 1.2, and 1.2 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenous (III) acid (2011 – 2016)

CAS Number 13464-58-9

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	.520 (<LOD-.600)	.840 (.760-.960)	1.11 (.980-1.27)	2517
Total population (2013 - 2014)	.316 (.275-.365)	.470 (.360-.560)	.730 (.660-.810)	1.00 (.930-1.07)	1.19 (1.12-1.29)	2654
Total population (2015 - 2016)	*	< LOD	.530 (.390-.670)	.880 (.700-1.10)	1.12 (.960-1.33)	3094
Age 3-5 years (2015 - 2016)	*	< LOD	.490 (.330-.590)	.770 (.620-.950)	1.10 (.760-1.32)	507
Age 6-11 years (2011 - 2012)	*	< LOD	.540 (<LOD-.660)	.870 (.710-1.00)	1.03 (.820-1.22)	401
Age 6-11 years (2013 - 2014)	.360 (.278-.466)	.540 (.370-.630)	.810 (.680-.880)	1.05 (.930-1.13)	1.22 (1.07-1.32)	397
Age 6-11 years (2015 - 2016)	*	.160 (<LOD-.330)	.540 (.460-.640)	.790 (.660-.970)	1.00 (.790-1.21)	380
Age 12-19 years (2011 - 2012)	*	< LOD	.610 (.480-.720)	.920 (.810-1.14)	1.18 (.980-1.43)	392
Age 12-19 years (2013 - 2014)	.429 (.358-.515)	.570 (.490-.630)	.830 (.730-.930)	1.12 (1.00-1.28)	1.35 (1.13-1.57)	450
Age 12-19 years (2015 - 2016)	.276 (.211-.362)	.320 (.140-.490)	.710 (.540-.880)	1.06 (.900-1.24)	1.35 (1.06-1.74)	402
Age 20+ years (2011 - 2012)	*	< LOD	.500 (<LOD-.570)	.830 (.750-.940)	1.11 (.980-1.27)	1724
Age 20+ years (2013 - 2014)	.299 (.258-.346)	.430 (.300-.540)	.720 (.650-.790)	.970 (.890-1.07)	1.16 (1.08-1.27)	1807
Age 20+ years (2015 - 2016)	*	< LOD	.520 (.360-.640)	.860 (.650-1.09)	1.11 (.910-1.31)	1805
Males (2011 - 2012)	*	< LOD	.600 (.520-.680)	.980 (.840-1.13)	1.31 (1.11-1.59)	1264
Males (2013 - 2014)	.365 (.306-.436)	.540 (.420-.630)	.800 (.710-.890)	1.04 (.970-1.12)	1.21 (1.14-1.35)	1308
Males (2015 - 2016)	*	.260 (<LOD-.410)	.590 (.470-.800)	.980 (.780-1.21)	1.24 (1.02-1.60)	1537
Females (2011 - 2012)	*	< LOD	< LOD	.760 (.600-.840)	.940 (.810-1.07)	1253
Females (2013 - 2014)	.276 (.241-.315)	.400 (.260-.490)	.660 (.600-.730)	.940 (.850-1.04)	1.13 (1.05-1.28)	1346
Females (2015 - 2016)	*	< LOD	.440 (.310-.580)	.770 (.630-.970)	1.02 (.830-1.20)	1557
Mexican Americans (2011 - 2012)	*	< LOD	.570 (.490-.660)	.830 (.770-1.03)	1.14 (.880-1.37)	317
Mexican Americans (2013 - 2014)	.416 (.351-.494)	.580 (.460-.700)	.870 (.750-.990)	1.08 (1.03-1.18)	1.29 (1.17-1.47)	455
Mexican Americans (2015 - 2016)	.266 (.201-.351)	.350 (<LOD-.500)	.650 (.520-.830)	1.03 (.800-1.32)	1.33 (1.03-1.60)	591
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.520 (<LOD-.680)	.880 (.700-1.10)	1.21 (.980-1.57)	672
Non-Hispanic blacks (2013 - 2014)	.416 (.378-.458)	.550 (.490-.600)	.840 (.730-.900)	1.12 (1.00-1.20)	1.33 (1.18-1.46)	576
Non-Hispanic blacks (2015 - 2016)	*	.230 (<LOD-.480)	.670 (.470-.840)	1.09 (.830-1.40)	1.45 (.940-2.11)	678
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	.800 (.640-.900)	1.03 (.830-1.18)	825
Non-Hispanic whites (2013 - 2014)	.267 (.225-.316)	.380 (.170-.520)	.670 (.600-.730)	.900 (.820-.950)	1.05 (.940-1.21)	980
Non-Hispanic whites (2015 - 2016)	*	< LOD	.450 (.270-.590)	.760 (.540-1.00)	.990 (.750-1.20)	937
All Hispanics (2011 - 2012)	*	< LOD	.620 (.510-.760)	.910 (.820-1.07)	1.29 (1.07-1.43)	574
All Hispanics (2013 - 2014)	.423 (.358-.501)	.580 (.460-.700)	.880 (.790-.980)	1.11 (1.06-1.18)	1.35 (1.20-1.40)	703
All Hispanics (2015 - 2016)	.268 (.211-.339)	.340 (.150-.470)	.660 (.540-.830)	1.04 (.930-1.27)	1.32 (1.09-1.58)	992
Asians (2011 - 2012)	*	.510 (<LOD-.610)	.900 (.740-.990)	1.32 (1.10-1.63)	1.79 (1.53-2.31)	356
Asians (2013 - 2014)	.456 (.393-.528)	.600 (.500-.680)	.900 (.790-1.09)	1.34 (1.15-1.56)	1.66 (1.37-2.14)	291
Asians (2015 - 2016)	.302 (.232-.392)	.370 (.220-.520)	.760 (.610-.910)	1.17 (.960-1.62)	1.62 (1.24-2.21)	334

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.48, 0.12, and 0.12, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenous (III) acid (creatinine corrected) (2003 – 2010)

CAS Number 13464-58-9

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2568
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2588
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2870
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	292
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	354
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	379
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	1.95 (<LOD-2.76)	728
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	2.02 (<LOD-3.04)	703
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	456
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1548
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1531
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1820
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2035
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	2.43 (<LOD-3.15)	1276
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	2.93 (<LOD-3.54)	1402
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1312
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1468
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	3.08 (<LOD-4.44)	621
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	651
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	3.54 (<LOD-4.72)	513
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	2.00 (<LOD-2.29)	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	545
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1078
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1226

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Arsenous (III) acid (creatinine corrected) (2011 – 2016)

CAS Number 13464-58-9

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	.791 (<LOD-.850)	1.35 (1.21-1.42)	1.79 (1.55-1.89)	2516
Total population (2013 - 2014)	.365 (.311-.427)	.387 (.320-.460)	.715 (.612-.851)	1.23 (1.05-1.39)	1.62 (1.38-1.85)	2653
Total population (2015 - 2016)	*	< LOD	.469 (.348-.606)	.803 (.667-1.00)	1.14 (.918-1.34)	3091
Age 3-5 years (2015 - 2016)	*	< LOD	.800 (.573-1.00)	1.35 (1.00-2.00)	1.95 (1.33-2.83)	506
Age 6-11 years (2011 - 2012)	*	< LOD	1.03 (<LOD-1.13)	1.54 (1.26-1.79)	2.00 (1.55-2.62)	401
Age 6-11 years (2013 - 2014)	.541 (.415-.706)	.578 (.451-.711)	1.03 (.764-1.40)	1.70 (1.22-1.98)	1.94 (1.60-2.92)	397
Age 6-11 years (2015 - 2016)	*	.313 (<LOD-.400)	.534 (.425-.694)	.957 (.694-1.23)	1.27 (.966-1.79)	380
Age 12-19 years (2011 - 2012)	*	< LOD	.709 (.607-.850)	1.11 (.971-1.31)	1.36 (1.03-2.50)	392
Age 12-19 years (2013 - 2014)	.389 (.335-.452)	.390 (.321-.497)	.683 (.536-.862)	1.03 (.866-1.37)	1.43 (1.04-1.77)	450
Age 12-19 years (2015 - 2016)	.258 (.206-.324)	.268 (.195-.371)	.535 (.421-.627)	.837 (.733-.925)	1.12 (.922-1.31)	402
Age 20+ years (2011 - 2012)	*	< LOD	.773 (<LOD-.850)	1.36 (1.19-1.48)	1.79 (1.55-1.95)	1723
Age 20+ years (2013 - 2014)	.347 (.296-.407)	.366 (.303-.444)	.691 (.592-.832)	1.21 (1.00-1.37)	1.56 (1.36-1.82)	1806
Age 20+ years (2015 - 2016)	*	< LOD	.434 (.320-.574)	.750 (.615-.984)	1.08 (.860-1.27)	1803
Males (2011 - 2012)	*	< LOD	.708 (.645-.756)	1.12 (.981-1.25)	1.48 (1.28-1.70)	1263
Males (2013 - 2014)	.366 (.306-.436)	.388 (.311-.475)	.702 (.592-.825)	1.23 (.942-1.40)	1.59 (1.33-1.86)	1307
Males (2015 - 2016)	*	.250 (<LOD-.321)	.477 (.348-.621)	.773 (.644-1.05)	1.11 (.814-1.29)	1537
Females (2011 - 2012)	*	< LOD	< LOD	1.42 (1.36-1.62)	1.89 (1.70-2.27)	1253
Females (2013 - 2014)	.364 (.311-.426)	.387 (.320-.459)	.727 (.616-.889)	1.24 (1.05-1.42)	1.65 (1.40-1.91)	1346
Females (2015 - 2016)	*	< LOD	.457 (.338-.590)	.854 (.667-1.00)	1.16 (.918-1.45)	1554
Mexican Americans (2011 - 2012)	*	< LOD	.723 (.630-.850)	1.13 (.919-1.42)	1.55 (1.13-2.20)	317
Mexican Americans (2013 - 2014)	.475 (.386-.584)	.471 (.394-.634)	.843 (.692-1.11)	1.50 (1.19-1.79)	1.85 (1.67-2.07)	455
Mexican Americans (2015 - 2016)	.290 (.215-.392)	.308 (<LOD-.470)	.574 (.429-.788)	1.00 (.710-1.29)	1.27 (1.01-1.49)	590
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.514 (<LOD-.586)	.919 (.739-1.06)	1.22 (.971-1.64)	672
Non-Hispanic blacks (2013 - 2014)	.314 (.272-.362)	.328 (.285-.398)	.577 (.483-.673)	.878 (.782-.957)	1.05 (.957-1.24)	576
Non-Hispanic blacks (2015 - 2016)	*	.204 (<LOD-.321)	.422 (.308-.566)	.708 (.540-.932)	.965 (.690-1.25)	676
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	1.36 (1.21-1.48)	1.79 (1.51-2.00)	824
Non-Hispanic whites (2013 - 2014)	.329 (.275-.393)	.351 (.278-.433)	.653 (.553-.793)	1.17 (.900-1.37)	1.49 (1.30-1.72)	979
Non-Hispanic whites (2015 - 2016)	*	< LOD	.400 (.287-.557)	.706 (.538-.934)	1.00 (.733-1.25)	937
All Hispanics (2011 - 2012)	*	< LOD	.762 (.704-.833)	1.21 (1.00-1.48)	1.55 (1.34-1.95)	574
All Hispanics (2013 - 2014)	.472 (.388-.575)	.482 (.392-.638)	.851 (.718-1.05)	1.41 (1.13-1.74)	1.84 (1.65-2.06)	703
All Hispanics (2015 - 2016)	.301 (.239-.379)	.327 (.226-.442)	.612 (.500-.741)	1.01 (.780-1.27)	1.31 (1.16-1.55)	991
Asians (2011 - 2012)	*	.739 (<LOD-.850)	1.21 (1.06-1.45)	1.96 (1.62-2.43)	2.91 (2.00-3.64)	356
Asians (2013 - 2014)	.709 (.590-.854)	.779 (.596-.938)	1.22 (1.08-1.33)	1.98 (1.48-3.00)	3.04 (1.98-4.15)	291
Asians (2015 - 2016)	.410 (.315-.532)	.427 (.326-.596)	.894 (.616-1.21)	1.52 (1.05-2.29)	2.14 (1.41-3.31)	334

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Dimethylarsinic acid (2003 – 2010)

CAS Number 917-76-0

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	3.71 (3.33-4.14)	3.90 (3.00-4.00)	6.00 (5.00-7.00)	11.0 (9.20-12.0)	16.0 (13.0-17.8)	2568
Total population (2005 - 2006)	3.95 (3.59-4.35)	3.90 (3.46-4.31)	6.17 (5.53-7.04)	10.3 (9.00-12.2)	15.0 (12.2-17.8)	2588
Total population (2007 - 2008)	3.67 (3.44-3.91)	3.58 (3.44-3.84)	5.96 (5.44-6.57)	9.78 (8.72-11.2)	13.3 (11.8-15.3)	2576
Total population (2009 - 2010)	3.67 (3.43-3.93)	3.50 (3.25-3.76)	6.16 (5.59-6.73)	11.5 (9.35-13.7)	17.4 (14.0-21.0)	2871
Age 6-11 years (2003 - 2004)	3.73 (3.12-4.45)	4.00 (3.00-4.00)	6.00 (5.00-7.00)	9.00 (7.00-12.0)	12.0 (8.00-22.0)	292
Age 6-11 years (2005 - 2006)	3.96 (3.49-4.49)	3.94 (3.20-4.71)	5.94 (5.01-7.10)	10.5 (7.10-12.1)	13.0 (10.7-15.3)	354
Age 6-11 years (2007 - 2008)	3.86 (3.45-4.32)	3.76 (3.47-4.01)	6.10 (5.29-6.99)	10.4 (7.57-13.9)	15.2 (9.32-39.2)	390
Age 6-11 years (2009 - 2010)	3.53 (3.17-3.92)	3.27 (2.81-3.87)	5.76 (5.07-6.53)	10.7 (7.84-11.9)	12.8 (11.0-14.4)	380
Age 12-19 years (2003 - 2004)	3.85 (3.34-4.42)	4.00 (3.00-4.00)	6.00 (5.00-7.10)	9.30 (7.70-12.0)	13.0 (10.0-16.0)	728
Age 12-19 years (2005 - 2006)	3.97 (3.46-4.55)	3.97 (3.31-4.64)	5.74 (5.11-7.10)	9.43 (7.63-11.6)	12.0 (10.7-13.9)	703
Age 12-19 years (2007 - 2008)	3.60 (3.16-4.09)	3.66 (3.24-4.26)	5.53 (4.75-6.72)	8.90 (7.33-9.95)	10.7 (9.08-13.3)	366
Age 12-19 years (2009 - 2010)	3.08 (2.77-3.43)	2.89 (2.64-3.29)	5.05 (4.44-5.77)	7.89 (6.87-10.1)	11.3 (8.75-13.8)	456
Age 20+ years (2003 - 2004)	3.69 (3.31-4.11)	3.70 (3.00-4.00)	6.00 (5.00-7.00)	11.0 (10.0-12.0)	16.0 (13.0-19.0)	1548
Age 20+ years (2005 - 2006)	3.95 (3.58-4.36)	3.87 (3.46-4.32)	6.30 (5.59-7.28)	10.3 (9.25-13.3)	16.2 (12.5-19.4)	1531
Age 20+ years (2007 - 2008)	3.66 (3.43-3.91)	3.56 (3.41-3.80)	5.97 (5.44-6.63)	9.89 (8.72-11.4)	13.8 (11.8-15.5)	1820
Age 20+ years (2009 - 2010)	3.79 (3.51-4.09)	3.60 (3.33-3.87)	6.40 (5.71-7.03)	12.1 (9.52-16.0)	18.2 (15.8-23.6)	2035
Males (2003 - 2004)	4.12 (3.60-4.71)	4.00 (3.70-4.30)	6.00 (5.60-7.70)	11.0 (9.00-15.0)	17.0 (12.1-22.0)	1284
Males (2005 - 2006)	4.17 (3.79-4.59)	4.04 (3.68-4.43)	6.32 (5.41-7.61)	10.5 (8.68-13.3)	14.8 (11.8-19.2)	1276
Males (2007 - 2008)	4.05 (3.73-4.40)	3.96 (3.63-4.27)	6.53 (5.77-7.15)	10.3 (9.31-12.0)	14.6 (11.6-20.2)	1289
Males (2009 - 2010)	3.89 (3.50-4.32)	3.71 (3.35-4.11)	6.33 (5.80-7.02)	11.6 (8.80-17.3)	19.2 (13.0-24.7)	1403
Females (2003 - 2004)	3.37 (3.00-3.78)	3.00 (3.00-4.00)	5.50 (4.80-6.20)	10.0 (8.00-11.0)	14.0 (11.0-17.7)	1284
Females (2005 - 2006)	3.75 (3.37-4.18)	3.70 (3.28-4.21)	6.03 (5.46-6.99)	9.95 (8.81-12.2)	15.5 (11.6-19.0)	1312
Females (2007 - 2008)	3.34 (3.13-3.57)	3.37 (3.15-3.53)	5.48 (5.00-6.05)	8.99 (7.97-10.4)	11.9 (10.7-13.9)	1287
Females (2009 - 2010)	3.48 (3.22-3.76)	3.28 (2.95-3.63)	5.85 (5.21-6.69)	11.5 (9.42-13.3)	16.1 (13.8-17.7)	1468
Mexican Americans (2003 - 2004)	4.72 (4.27-5.22)	4.80 (4.00-5.00)	7.00 (6.00-9.00)	12.0 (10.0-16.0)	17.0 (12.0-25.0)	621
Mexican Americans (2005 - 2006)	4.43 (4.15-4.72)	4.66 (4.26-5.13)	6.93 (6.38-7.58)	9.51 (8.70-11.1)	13.1 (10.3-15.1)	651
Mexican Americans (2007 - 2008)	4.36 (4.05-4.69)	4.62 (4.07-5.07)	7.14 (6.23-7.76)	9.67 (8.39-10.8)	11.7 (9.96-17.6)	513
Mexican Americans (2009 - 2010)	3.90 (3.45-4.40)	3.98 (3.18-4.63)	6.53 (5.61-7.15)	10.7 (8.95-13.2)	16.2 (13.1-19.2)	618
Non-Hispanic blacks (2003 - 2004)	4.27 (3.71-4.92)	4.00 (3.50-5.00)	7.00 (6.00-8.00)	11.6 (9.00-15.0)	16.0 (14.0-18.7)	725
Non-Hispanic blacks (2005 - 2006)	4.28 (3.68-4.98)	4.02 (3.37-4.82)	6.42 (5.31-7.36)	10.9 (8.22-13.1)	15.2 (11.5-27.1)	695
Non-Hispanic blacks (2007 - 2008)	4.19 (3.92-4.49)	3.98 (3.63-4.27)	6.69 (5.80-7.43)	11.2 (10.1-12.5)	14.7 (12.1-19.2)	586
Non-Hispanic blacks (2009 - 2010)	4.09 (3.63-4.61)	3.93 (3.31-4.36)	7.13 (5.99-8.63)	12.3 (10.1-17.0)	18.2 (13.7-27.8)	546
Non-Hispanic whites (2003 - 2004)	3.27 (2.95-3.62)	3.00 (3.00-3.80)	5.00 (4.60-6.00)	9.00 (7.00-10.0)	12.0 (9.50-15.0)	1078
Non-Hispanic whites (2005 - 2006)	3.69 (3.28-4.15)	3.60 (3.19-4.08)	5.66 (5.10-6.70)	9.62 (8.11-11.8)	13.9 (10.6-17.8)	1050
Non-Hispanic whites (2007 - 2008)	3.23 (3.01-3.48)	3.34 (3.04-3.53)	5.14 (4.77-5.59)	8.27 (7.48-9.07)	10.5 (9.25-13.2)	1063
Non-Hispanic whites (2009 - 2010)	3.21 (3.07-3.37)	3.12 (2.91-3.29)	5.32 (5.00-5.66)	8.65 (7.23-10.1)	12.0 (10.1-14.4)	1226

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 1.7, 1.7, 1.7, and 1.7 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Dimethylarsinic acid (2011 – 2016)

CAS Number 917-76-0

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	3.47 (3.18-3.78)	3.37 (3.06-3.66)	5.81 (5.14-6.59)	9.55 (8.43-11.2)	14.0 (11.4-16.5)	2517
Total population (2013 - 2014)	3.20 (2.97-3.44)	3.08 (2.73-3.41)	5.15 (4.68-5.69)	8.60 (8.02-9.25)	11.8 (10.6-13.5)	2654
Total population (2015 - 2016)	3.04 (2.89-3.21)	2.85 (2.65-3.12)	4.85 (4.59-5.13)	8.25 (7.32-9.53)	11.8 (10.0-14.6)	3094
Age 3-5 years (2015 - 2016)	2.76 (2.53-3.03)	2.62 (2.37-2.77)	4.09 (3.75-4.70)	8.03 (6.18-9.27)	10.5 (8.11-16.3)	507
Age 6-11 years (2011 - 2012)	3.43 (3.06-3.85)	3.53 (2.81-4.05)	5.81 (5.21-6.38)	8.60 (7.55-9.73)	11.4 (9.35-13.7)	401
Age 6-11 years (2013 - 2014)	3.33 (2.95-3.75)	3.12 (2.68-3.56)	5.27 (4.31-6.14)	8.69 (7.44-10.8)	11.8 (8.62-18.5)	397
Age 6-11 years (2015 - 2016)	3.01 (2.75-3.30)	2.98 (2.50-3.26)	4.48 (3.89-5.02)	7.32 (5.49-9.21)	11.3 (7.81-18.5)	380
Age 12-19 years (2011 - 2012)	3.27 (2.71-3.94)	3.33 (2.49-4.20)	5.02 (4.33-6.05)	8.53 (6.29-11.1)	11.6 (8.74-17.9)	392
Age 12-19 years (2013 - 2014)	3.30 (2.99-3.63)	3.24 (2.86-3.66)	4.95 (4.53-5.66)	9.02 (6.97-10.6)	11.4 (10.0-13.1)	450
Age 12-19 years (2015 - 2016)	2.84 (2.64-3.06)	2.65 (2.36-2.79)	4.15 (3.69-4.78)	7.12 (5.87-8.60)	9.88 (8.56-13.8)	402
Age 20+ years (2011 - 2012)	3.51 (3.22-3.82)	3.37 (3.05-3.67)	5.91 (5.20-6.83)	9.94 (8.57-11.5)	14.1 (12.2-16.4)	1724
Age 20+ years (2013 - 2014)	3.17 (2.93-3.43)	3.02 (2.66-3.41)	5.18 (4.68-5.78)	8.53 (7.82-9.21)	11.7 (10.3-14.2)	1807
Age 20+ years (2015 - 2016)	3.09 (2.92-3.27)	2.95 (2.67-3.17)	4.99 (4.65-5.25)	8.64 (7.53-9.93)	12.0 (10.1-15.0)	1805
Males (2011 - 2012)	3.79 (3.40-4.23)	3.71 (3.33-4.29)	6.27 (5.36-7.61)	10.3 (8.75-12.5)	15.3 (12.5-16.7)	1264
Males (2013 - 2014)	3.31 (3.12-3.51)	3.25 (3.02-3.56)	5.34 (5.03-5.61)	8.56 (8.11-9.30)	11.6 (10.3-12.8)	1308
Males (2015 - 2016)	3.20 (3.02-3.39)	3.08 (2.70-3.38)	5.13 (4.73-5.33)	8.62 (7.52-9.93)	11.8 (9.93-15.1)	1537
Females (2011 - 2012)	3.19 (2.92-3.48)	3.01 (2.73-3.30)	5.30 (4.61-5.96)	8.96 (7.72-10.5)	12.2 (9.56-17.8)	1253
Females (2013 - 2014)	3.09 (2.81-3.40)	2.81 (2.53-3.23)	4.85 (4.27-5.82)	8.60 (7.56-9.54)	11.9 (10.6-14.6)	1346
Females (2015 - 2016)	2.90 (2.74-3.07)	2.70 (2.43-2.95)	4.63 (4.29-5.00)	7.96 (6.81-9.65)	11.9 (10.0-13.8)	1557
Mexican Americans (2011 - 2012)	3.67 (3.33-4.04)	3.58 (3.27-4.18)	5.82 (5.24-6.47)	9.05 (7.91-10.0)	12.1 (9.61-17.4)	317
Mexican Americans (2013 - 2014)	3.32 (3.10-3.54)	3.45 (2.94-3.84)	5.19 (4.79-5.75)	7.74 (7.22-8.45)	9.94 (8.21-12.7)	455
Mexican Americans (2015 - 2016)	3.28 (2.96-3.63)	3.16 (2.88-3.61)	4.97 (4.43-5.57)	8.06 (6.80-11.3)	11.9 (8.70-16.0)	591
Non-Hispanic blacks (2011 - 2012)	4.05 (3.46-4.74)	4.05 (3.35-4.65)	6.78 (5.46-8.21)	12.0 (10.0-14.2)	17.4 (14.2-19.8)	672
Non-Hispanic blacks (2013 - 2014)	3.83 (3.35-4.39)	3.62 (3.21-4.05)	5.84 (4.60-7.84)	10.2 (8.42-13.2)	15.7 (10.9-20.7)	576
Non-Hispanic blacks (2015 - 2016)	3.54 (3.23-3.88)	3.39 (2.92-3.80)	5.96 (4.86-6.80)	10.7 (9.30-11.7)	14.3 (11.2-19.6)	678
Non-Hispanic whites (2011 - 2012)	3.06 (2.82-3.33)	2.97 (2.72-3.29)	4.95 (4.39-5.77)	7.98 (6.92-9.02)	10.5 (8.71-13.0)	825
Non-Hispanic whites (2013 - 2014)	2.86 (2.59-3.15)	2.69 (2.29-3.10)	4.56 (3.96-5.21)	7.52 (6.61-8.52)	9.62 (8.53-11.3)	980
Non-Hispanic whites (2015 - 2016)	2.67 (2.55-2.80)	2.46 (2.30-2.65)	4.28 (3.87-4.63)	6.40 (5.73-7.06)	9.18 (7.61-10.1)	937
All Hispanics (2011 - 2012)	4.02 (3.45-4.69)	3.96 (3.33-4.68)	6.73 (5.49-8.39)	11.1 (8.53-16.6)	16.8 (12.1-19.7)	574
All Hispanics (2013 - 2014)	3.54 (3.16-3.97)	3.61 (3.07-4.11)	5.63 (5.01-6.88)	9.09 (7.80-10.3)	11.8 (9.98-12.9)	703
All Hispanics (2015 - 2016)	3.51 (3.17-3.88)	3.32 (3.05-3.71)	5.54 (4.92-6.34)	9.17 (7.89-11.8)	13.9 (10.5-16.0)	992
Asians (2011 - 2012)	7.38 (6.50-8.37)	7.52 (6.45-8.74)	14.4 (11.7-17.2)	24.7 (20.3-31.3)	38.6 (28.5-40.5)	356
Asians (2013 - 2014)	5.59 (5.13-6.09)	5.62 (5.08-6.53)	11.3 (9.01-12.4)	19.9 (15.6-22.1)	23.6 (19.7-34.6)	291
Asians (2015 - 2016)	6.31 (5.46-7.29)	6.52 (5.05-7.50)	12.0 (9.86-14.2)	19.8 (14.2-28.8)	27.3 (19.8-40.6)	334

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 1.8, 1.91, and 1.91, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Dimethylarsinic acid (creatinine corrected) (2003 – 2010)

CAS Number 917-76-0

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	3.69 (3.24-4.19)	3.37 (2.94-3.91)	5.71 (4.69-6.74)	9.09 (7.61-11.5)	13.0 (10.7-16.0)	2568
Total population (2005 - 2006)	3.88 (3.57-4.22)	3.66 (3.39-3.93)	5.71 (5.10-6.43)	9.57 (7.95-10.9)	12.3 (10.6-15.0)	2588
Total population (2007 - 2008)	3.83 (3.60-4.07)	3.62 (3.37-3.93)	5.80 (5.33-6.32)	9.01 (8.00-9.97)	11.6 (9.97-14.4)	2576
Total population (2009 - 2010)	3.90 (3.64-4.18)	3.53 (3.30-3.80)	6.03 (5.36-6.62)	10.2 (9.15-11.8)	14.9 (12.3-19.2)	2870
Age 6-11 years (2003 - 2004)	4.34 (3.57-5.28)	4.03 (3.20-4.80)	6.32 (4.65-8.33)	10.3 (7.00-13.9)	13.9 (7.86-21.8)	292
Age 6-11 years (2005 - 2006)	4.89 (4.22-5.65)	4.31 (3.64-5.69)	6.85 (5.71-7.69)	10.0 (7.54-14.7)	14.7 (10.0-18.8)	354
Age 6-11 years (2007 - 2008)	5.07 (4.56-5.64)	4.54 (4.08-4.82)	6.90 (6.14-7.76)	12.0 (8.39-17.1)	20.9 (12.0-40.8)	390
Age 6-11 years (2009 - 2010)	4.77 (4.34-5.23)	4.48 (4.12-4.85)	6.41 (5.66-6.82)	10.0 (7.63-15.3)	16.5 (9.33-27.0)	379
Age 12-19 years (2003 - 2004)	2.74 (2.39-3.14)	2.55 (2.27-2.94)	3.77 (3.17-4.44)	5.88 (4.65-6.67)	7.18 (6.16-11.7)	728
Age 12-19 years (2005 - 2006)	3.05 (2.78-3.34)	2.92 (2.55-3.29)	4.25 (3.87-4.84)	6.68 (5.49-8.06)	9.08 (7.11-10.6)	703
Age 12-19 years (2007 - 2008)	2.80 (2.54-3.09)	2.69 (2.37-2.93)	3.91 (3.46-4.56)	6.27 (4.72-8.21)	8.21 (5.77-10.1)	366
Age 12-19 years (2009 - 2010)	2.89 (2.61-3.20)	2.60 (2.36-2.86)	4.08 (3.43-4.80)	6.67 (5.71-8.57)	10.0 (7.61-12.6)	456
Age 20+ years (2003 - 2004)	3.79 (3.34-4.31)	3.48 (3.00-4.00)	5.95 (4.86-7.05)	9.45 (8.00-12.0)	13.5 (11.1-18.6)	1548
Age 20+ years (2005 - 2006)	3.93 (3.62-4.27)	3.71 (3.42-4.02)	5.82 (5.22-6.47)	9.74 (8.00-11.2)	12.6 (10.9-15.8)	1531
Age 20+ years (2007 - 2008)	3.89 (3.64-4.16)	3.69 (3.44-4.02)	5.96 (5.47-6.58)	9.10 (8.00-10.0)	11.6 (9.74-14.5)	1820
Age 20+ years (2009 - 2010)	4.00 (3.70-4.32)	3.61 (3.33-3.90)	6.25 (5.57-6.88)	10.8 (9.23-12.9)	16.1 (12.6-22.2)	2035
Males (2003 - 2004)	3.48 (2.95-4.10)	3.16 (2.70-3.82)	5.46 (4.17-6.90)	8.59 (6.92-12.0)	12.3 (8.84-18.9)	1284
Males (2005 - 2006)	3.43 (3.13-3.75)	3.24 (2.91-3.63)	5.11 (4.25-6.08)	7.90 (6.65-9.77)	11.0 (9.29-13.0)	1276
Males (2007 - 2008)	3.63 (3.41-3.85)	3.44 (3.22-3.68)	5.33 (5.00-5.82)	8.31 (7.21-10.1)	12.1 (9.73-14.9)	1289
Males (2009 - 2010)	3.54 (3.29-3.80)	3.20 (3.04-3.38)	5.31 (4.80-5.99)	9.24 (7.80-10.8)	13.3 (10.3-16.5)	1402
Females (2003 - 2004)	3.89 (3.49-4.34)	3.57 (3.13-4.06)	5.78 (4.95-6.67)	9.32 (8.00-11.5)	13.7 (10.6-18.6)	1284
Females (2005 - 2006)	4.37 (4.03-4.75)	4.03 (3.72-4.51)	6.26 (5.71-6.84)	10.0 (8.50-12.6)	14.4 (11.2-19.3)	1312
Females (2007 - 2008)	4.02 (3.75-4.32)	3.80 (3.46-4.26)	6.15 (5.58-7.06)	9.23 (8.11-10.1)	10.9 (9.52-14.9)	1287
Females (2009 - 2010)	4.28 (3.96-4.63)	4.00 (3.62-4.32)	6.55 (5.98-7.14)	11.0 (9.64-13.2)	17.2 (13.2-24.4)	1468
Mexican Americans (2003 - 2004)	4.38 (3.80-5.05)	4.11 (3.29-4.90)	6.25 (4.84-8.15)	10.3 (8.00-11.8)	12.9 (11.1-15.2)	621
Mexican Americans (2005 - 2006)	4.16 (3.83-4.52)	4.00 (3.65-4.36)	5.94 (5.40-6.49)	8.69 (7.23-9.65)	10.2 (9.52-13.2)	651
Mexican Americans (2007 - 2008)	4.34 (3.87-4.88)	4.19 (3.66-4.83)	6.23 (5.31-7.44)	9.14 (8.00-11.0)	12.1 (10.1-15.1)	513
Mexican Americans (2009 - 2010)	4.06 (3.63-4.54)	3.95 (3.33-4.44)	6.32 (5.36-7.10)	9.23 (8.10-10.6)	11.7 (10.2-14.8)	618
Non-Hispanic blacks (2003 - 2004)	3.08 (2.69-3.52)	2.86 (2.60-3.24)	4.34 (3.82-5.05)	7.81 (5.82-9.45)	10.4 (7.61-16.9)	725
Non-Hispanic blacks (2005 - 2006)	3.08 (2.70-3.52)	2.91 (2.52-3.32)	4.21 (3.75-4.91)	7.33 (5.40-10.7)	11.6 (7.66-17.9)	695
Non-Hispanic blacks (2007 - 2008)	3.08 (2.87-3.31)	2.77 (2.56-3.13)	4.74 (4.31-5.22)	7.29 (6.58-8.26)	9.67 (8.26-11.0)	586
Non-Hispanic blacks (2009 - 2010)	3.26 (2.90-3.66)	2.86 (2.47-3.34)	5.10 (4.43-6.06)	10.0 (7.39-11.7)	13.1 (11.1-15.2)	545
Non-Hispanic whites (2003 - 2004)	3.44 (2.97-3.98)	3.17 (2.80-3.73)	5.16 (4.03-6.49)	8.00 (6.32-10.9)	11.1 (8.00-15.4)	1078
Non-Hispanic whites (2005 - 2006)	3.82 (3.47-4.21)	3.64 (3.30-3.93)	5.71 (4.90-6.51)	9.23 (7.26-10.6)	11.6 (9.93-13.9)	1050
Non-Hispanic whites (2007 - 2008)	3.62 (3.38-3.87)	3.48 (3.20-3.76)	5.38 (4.95-5.80)	8.00 (7.28-8.86)	10.0 (8.96-11.1)	1063
Non-Hispanic whites (2009 - 2010)	3.58 (3.36-3.81)	3.31 (3.09-3.49)	5.30 (4.87-5.75)	8.12 (7.06-9.21)	11.5 (9.43-14.3)	1226

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Dimethylarsinic acid (creatinine corrected) (2011 – 2016)

CAS Number 917-76-0

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	3.92 (3.69-4.16)	3.65 (3.47-3.91)	5.92 (5.40-6.49)	9.86 (8.68-11.3)	13.1 (11.5-15.2)	2516
Total population (2013 - 2014)	3.68 (3.46-3.92)	3.47 (3.17-3.79)	5.53 (5.11-5.97)	9.18 (8.11-10.2)	12.7 (11.4-13.6)	2653
Total population (2015 - 2016)	3.41 (3.26-3.56)	3.32 (3.15-3.48)	5.19 (5.03-5.40)	8.45 (7.56-9.51)	12.6 (10.6-14.4)	3091
Age 3-5 years (2015 - 2016)	6.15 (5.58-6.77)	5.87 (5.31-6.14)	8.65 (7.61-9.97)	13.2 (11.8-15.0)	17.3 (13.5-22.5)	506
Age 6-11 years (2011 - 2012)	4.86 (4.54-5.21)	4.44 (4.10-4.70)	6.82 (6.15-7.69)	9.77 (8.65-11.5)	13.8 (10.3-15.0)	401
Age 6-11 years (2013 - 2014)	5.00 (4.56-5.50)	4.59 (4.06-5.40)	7.50 (6.62-8.44)	10.8 (9.11-12.3)	13.3 (12.0-14.4)	397
Age 6-11 years (2015 - 2016)	4.29 (4.01-4.59)	3.97 (3.79-4.42)	6.01 (5.34-6.43)	9.44 (7.50-11.5)	14.4 (10.5-18.6)	380
Age 12-19 years (2011 - 2012)	3.13 (2.68-3.64)	3.02 (2.48-3.34)	4.51 (3.49-5.62)	7.03 (5.08-10.8)	10.8 (6.13-18.1)	392
Age 12-19 years (2013 - 2014)	2.99 (2.68-3.33)	2.74 (2.57-3.00)	4.32 (3.65-5.28)	6.80 (5.81-7.46)	9.30 (6.94-12.8)	450
Age 12-19 years (2015 - 2016)	2.65 (2.49-2.83)	2.52 (2.29-2.75)	3.80 (3.29-4.22)	6.42 (5.29-7.27)	8.90 (7.02-12.3)	402
Age 20+ years (2011 - 2012)	3.96 (3.75-4.19)	3.73 (3.52-3.94)	6.05 (5.45-6.68)	10.1 (8.97-11.3)	13.1 (11.5-15.5)	1723
Age 20+ years (2013 - 2014)	3.68 (3.46-3.91)	3.48 (3.21-3.75)	5.47 (5.12-5.89)	9.32 (8.24-10.3)	13.0 (11.3-14.7)	1806
Age 20+ years (2015 - 2016)	3.36 (3.20-3.53)	3.30 (3.11-3.47)	5.12 (4.89-5.40)	8.44 (7.50-9.51)	12.2 (10.4-14.5)	1803
Males (2011 - 2012)	3.55 (3.27-3.86)	3.34 (3.11-3.69)	5.32 (4.75-6.06)	8.47 (7.35-9.73)	11.0 (9.45-14.1)	1263
Males (2013 - 2014)	3.31 (3.12-3.51)	3.03 (2.92-3.29)	4.79 (4.57-5.05)	8.05 (7.51-9.13)	11.4 (10.3-12.8)	1307
Males (2015 - 2016)	3.03 (2.85-3.23)	2.92 (2.66-3.19)	4.62 (4.42-4.82)	7.42 (6.47-8.44)	10.4 (8.54-13.3)	1537
Females (2011 - 2012)	4.30 (4.06-4.56)	4.10 (3.85-4.35)	6.68 (5.93-7.36)	10.8 (9.77-12.4)	14.9 (12.4-17.0)	1253
Females (2013 - 2014)	4.08 (3.75-4.44)	3.94 (3.54-4.29)	6.16 (5.64-6.90)	9.84 (8.39-12.0)	13.4 (11.3-15.4)	1346
Females (2015 - 2016)	3.81 (3.62-4.00)	3.65 (3.50-3.86)	5.63 (5.40-5.82)	9.73 (8.70-10.6)	13.5 (11.5-16.9)	1554
Mexican Americans (2011 - 2012)	4.12 (3.83-4.44)	4.10 (3.43-4.59)	5.77 (5.29-6.37)	8.06 (7.49-9.54)	10.5 (8.70-14.8)	317
Mexican Americans (2013 - 2014)	3.78 (3.61-3.96)	3.72 (3.55-3.94)	5.11 (4.81-5.40)	7.29 (6.75-7.94)	9.73 (7.53-11.7)	455
Mexican Americans (2015 - 2016)	3.55 (3.20-3.93)	3.46 (3.14-3.92)	5.14 (4.82-5.71)	7.11 (6.75-8.44)	10.3 (8.44-11.5)	590
Non-Hispanic blacks (2011 - 2012)	3.16 (2.66-3.74)	3.05 (2.41-3.67)	4.98 (4.01-6.08)	8.27 (6.68-9.70)	11.3 (8.87-13.7)	672
Non-Hispanic blacks (2013 - 2014)	2.89 (2.53-3.30)	2.68 (2.33-3.05)	4.40 (3.70-5.00)	6.81 (5.84-8.72)	10.1 (7.41-12.5)	576
Non-Hispanic blacks (2015 - 2016)	2.81 (2.53-3.12)	2.62 (2.41-3.00)	4.50 (3.94-4.89)	7.14 (5.79-9.62)	11.3 (8.34-14.7)	676
Non-Hispanic whites (2011 - 2012)	3.68 (3.44-3.93)	3.47 (3.31-3.63)	5.32 (5.04-5.93)	9.07 (7.47-10.3)	11.5 (9.87-13.1)	824
Non-Hispanic whites (2013 - 2014)	3.52 (3.22-3.84)	3.38 (2.94-3.75)	5.24 (4.70-5.87)	8.64 (7.50-10.1)	12.0 (9.54-13.5)	979
Non-Hispanic whites (2015 - 2016)	3.15 (3.01-3.30)	3.15 (2.94-3.38)	4.76 (4.50-5.00)	6.75 (6.08-7.84)	9.59 (8.00-11.1)	937
All Hispanics (2011 - 2012)	4.50 (4.14-4.89)	4.38 (4.20-4.82)	6.62 (5.91-7.47)	9.46 (8.09-10.6)	13.0 (9.66-16.6)	574
All Hispanics (2013 - 2014)	3.95 (3.69-4.23)	3.84 (3.64-4.08)	5.56 (5.12-6.09)	7.92 (6.98-9.33)	11.0 (8.07-14.0)	703
All Hispanics (2015 - 2016)	3.93 (3.61-4.26)	3.75 (3.38-4.22)	6.04 (5.44-6.50)	9.00 (8.38-10.3)	12.4 (10.4-14.9)	991
Asians (2011 - 2012)	9.89 (8.57-11.4)	9.72 (8.10-11.0)	15.6 (12.4-20.5)	28.6 (20.1-41.1)	45.1 (34.3-57.2)	356
Asians (2013 - 2014)	8.71 (7.85-9.67)	8.44 (7.33-9.33)	13.8 (12.2-17.0)	24.7 (18.7-34.4)	37.9 (27.5-44.4)	291
Asians (2015 - 2016)	8.57 (7.46-9.85)	8.56 (7.40-9.64)	14.6 (11.7-18.2)	25.2 (20.7-28.5)	29.4 (26.8-34.8)	334

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Monomethylarsonic acid (2003 – 2010)

CAS Number 65513-69-1

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	1.20 (1.00-1.30)	1.90 (1.60-2.10)	2.40 (2.00-2.80)	2567
Total population (2005 - 2006)	*	< LOD	1.19 (1.05-1.34)	1.72 (1.51-1.94)	2.12 (1.79-2.70)	2588
Total population (2007 - 2008)	*	< LOD	1.11 (1.00-1.20)	1.61 (1.51-1.69)	2.09 (1.91-2.26)	2576
Total population (2009 - 2010)	*	< LOD	1.02 (.920-1.10)	1.64 (1.41-1.83)	2.01 (1.82-2.28)	2871
Age 6-11 years (2003 - 2004)	*	< LOD	1.00 (<LOD-1.40)	1.80 (1.30-2.60)	2.30 (1.70-2.90)	292
Age 6-11 years (2005 - 2006)	*	< LOD	1.03 (<LOD-1.37)	1.54 (1.37-2.12)	2.12 (1.51-2.73)	354
Age 6-11 years (2007 - 2008)	*	< LOD	1.05 (<LOD-1.28)	1.60 (1.32-1.83)	2.04 (1.64-2.86)	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	1.38 (1.00-1.84)	1.81 (1.26-2.13)	380
Age 12-19 years (2003 - 2004)	*	< LOD	1.50 (1.10-1.80)	2.20 (1.70-3.00)	2.90 (2.20-3.60)	728
Age 12-19 years (2005 - 2006)	*	< LOD	1.31 (1.09-1.46)	1.99 (1.62-2.23)	2.41 (2.04-2.89)	703
Age 12-19 years (2007 - 2008)	*	< LOD	1.26 (1.11-1.35)	1.83 (1.54-2.22)	2.31 (1.87-2.90)	366
Age 12-19 years (2009 - 2010)	*	< LOD	1.10 (.910-1.25)	1.62 (1.33-1.92)	2.03 (1.74-2.30)	456
Age 20+ years (2003 - 2004)	*	< LOD	1.20 (1.00-1.30)	1.80 (1.50-2.10)	2.30 (2.00-2.60)	1547
Age 20+ years (2005 - 2006)	*	< LOD	1.20 (1.05-1.33)	1.70 (1.48-1.90)	2.06 (1.74-2.75)	1531
Age 20+ years (2007 - 2008)	*	< LOD	1.08 (.970-1.17)	1.58 (1.44-1.71)	1.98 (1.82-2.21)	1820
Age 20+ years (2009 - 2010)	*	< LOD	1.02 (.930-1.11)	1.65 (1.42-1.86)	2.03 (1.81-2.35)	2035
Males (2003 - 2004)	*	< LOD	1.30 (1.10-1.60)	2.00 (1.80-2.40)	2.60 (2.10-3.00)	1283
Males (2005 - 2006)	*	< LOD	1.31 (1.12-1.49)	1.79 (1.57-2.09)	2.23 (1.85-2.86)	1276
Males (2007 - 2008)	*	< LOD	1.24 (1.13-1.35)	1.78 (1.63-1.94)	2.33 (1.97-2.71)	1289
Males (2009 - 2010)	*	< LOD	1.07 (.970-1.23)	1.77 (1.47-2.01)	2.19 (1.83-2.68)	1403
Females (2003 - 2004)	*	< LOD	1.00 (<LOD-1.20)	1.60 (1.30-1.90)	2.10 (1.70-2.60)	1284
Females (2005 - 2006)	*	< LOD	1.08 (.920-1.24)	1.57 (1.36-1.90)	2.04 (1.67-2.50)	1312
Females (2007 - 2008)	*	< LOD	.970 (<LOD-1.06)	1.42 (1.30-1.57)	1.81 (1.68-1.90)	1287
Females (2009 - 2010)	*	< LOD	.950 (<LOD-1.06)	1.52 (1.27-1.74)	1.89 (1.66-2.12)	1468
Mexican Americans (2003 - 2004)	*	< LOD	1.50 (1.20-1.90)	2.20 (1.70-2.80)	2.80 (2.00-4.40)	621
Mexican Americans (2005 - 2006)	*	< LOD	1.19 (1.10-1.32)	1.73 (1.51-1.97)	2.04 (1.67-2.51)	651
Mexican Americans (2007 - 2008)	*	< LOD	1.22 (1.02-1.35)	1.69 (1.43-2.12)	2.32 (1.75-2.85)	513
Mexican Americans (2009 - 2010)	*	< LOD	1.02 (<LOD-1.37)	1.65 (1.38-1.90)	2.02 (1.65-2.33)	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	1.10 (<LOD-1.30)	1.80 (1.40-2.00)	2.20 (1.70-2.70)	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	1.02 (.950-1.07)	1.35 (1.29-1.44)	1.70 (1.50-1.88)	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	1.21 (1.09-1.33)	1.79 (1.61-2.05)	2.32 (2.15-2.63)	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	1.02 (<LOD-1.18)	1.51 (1.36-1.84)	1.88 (1.73-2.24)	546
Non-Hispanic whites (2003 - 2004)	*	< LOD	1.10 (.900-1.30)	1.80 (1.40-2.00)	2.10 (1.80-2.50)	1077
Non-Hispanic whites (2005 - 2006)	*	< LOD	1.22 (1.02-1.39)	1.75 (1.42-2.12)	2.14 (1.72-2.93)	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	1.04 (.930-1.15)	1.50 (1.37-1.63)	1.91 (1.69-2.09)	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	.940 (<LOD-1.04)	1.45 (1.24-1.76)	1.90 (1.65-2.12)	1226

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.9, 0.9, 0.9, and 0.9 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Monomethylarsonic acid (2011 – 2016)

CAS Number 65513-69-1

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	1.36 (1.17-1.55)	1.83 (1.57-2.07)	2517
Total population (2013 - 2014)	.411 (.372-.454)	.460 (.390-.530)	.810 (.750-.870)	1.22 (1.11-1.33)	1.53 (1.36-1.74)	2654
Total population (2015 - 2016)	*	.280 (<LOD-.440)	.680 (.590-.790)	1.10 (.970-1.29)	1.45 (1.29-1.58)	3094
Age 3-5 years (2015 - 2016)	*	< LOD	.590 (.420-.670)	1.01 (.760-1.18)	1.20 (1.05-1.36)	507
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	1.21 (.970-1.40)	1.42 (1.24-1.54)	401
Age 6-11 years (2013 - 2014)	*	.380 (<LOD-.530)	.710 (.600-.850)	1.11 (.920-1.29)	1.47 (1.22-1.52)	397
Age 6-11 years (2015 - 2016)	*	.230 (<LOD-.340)	.590 (.470-.680)	.960 (.730-1.25)	1.27 (.960-1.73)	380
Age 12-19 years (2011 - 2012)	*	< LOD	.900 (<LOD-1.09)	1.28 (1.09-1.57)	1.59 (1.26-3.30)	392
Age 12-19 years (2013 - 2014)	.506 (.430-.596)	.580 (.480-.710)	.980 (.820-1.11)	1.28 (1.09-1.58)	1.58 (1.26-1.77)	450
Age 12-19 years (2015 - 2016)	.367 (.299-.450)	.340 (.210-.520)	.770 (.590-.930)	1.31 (1.05-1.46)	1.51 (1.42-1.92)	402
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	1.41 (1.15-1.67)	1.88 (1.58-2.08)	1724
Age 20+ years (2013 - 2014)	.406 (.365-.450)	.450 (.370-.520)	.790 (.740-.850)	1.21 (1.10-1.33)	1.57 (1.36-1.79)	1807
Age 20+ years (2015 - 2016)	*	.280 (<LOD-.450)	.680 (.590-.800)	1.10 (.970-1.29)	1.45 (1.29-1.67)	1805
Males (2011 - 2012)	*	< LOD	.950 (<LOD-1.14)	1.50 (1.26-1.85)	2.04 (1.79-2.40)	1264
Males (2013 - 2014)	.456 (.408-.510)	.520 (.450-.600)	.900 (.850-.940)	1.26 (1.18-1.37)	1.57 (1.39-1.74)	1308
Males (2015 - 2016)	*	.400 (.210-.530)	.760 (.650-.890)	1.21 (1.03-1.44)	1.55 (1.42-1.72)	1537
Females (2011 - 2012)	*	< LOD	< LOD	1.15 (1.02-1.40)	1.57 (1.41-1.79)	1253
Females (2013 - 2014)	.372 (.336-.412)	.400 (.300-.490)	.740 (.680-.770)	1.14 (.990-1.33)	1.49 (1.26-1.88)	1346
Females (2015 - 2016)	*	.220 (<LOD-.320)	.590 (.520-.680)	1.02 (.890-1.15)	1.32 (1.18-1.46)	1557
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	1.25 (1.04-1.65)	1.85 (1.25-3.26)	317
Mexican Americans (2013 - 2014)	.406 (.370-.446)	.470 (.380-.560)	.780 (.750-.860)	1.14 (1.01-1.27)	1.43 (1.17-1.69)	455
Mexican Americans (2015 - 2016)	*	.300 (<LOD-.420)	.690 (.560-.890)	1.17 (.910-1.46)	1.52 (1.25-2.08)	591
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	1.26 (1.01-1.55)	1.65 (1.34-2.02)	672
Non-Hispanic blacks (2013 - 2014)	.446 (.400-.496)	.520 (.430-.600)	.820 (.750-.890)	1.23 (1.03-1.39)	1.55 (1.28-1.96)	576
Non-Hispanic blacks (2015 - 2016)	*	.390 (<LOD-.590)	.820 (.680-.970)	1.29 (1.10-1.46)	1.59 (1.40-1.78)	678
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	1.24 (1.03-1.49)	1.71 (1.34-2.04)	825
Non-Hispanic whites (2013 - 2014)	.390 (.338-.451)	.430 (.320-.530)	.780 (.700-.860)	1.17 (1.04-1.31)	1.48 (1.22-1.81)	980
Non-Hispanic whites (2015 - 2016)	*	.240 (<LOD-.360)	.610 (.550-.710)	1.01 (.820-1.15)	1.22 (1.05-1.46)	937
All Hispanics (2011 - 2012)	*	< LOD	.960 (<LOD-1.25)	1.60 (1.32-1.99)	2.38 (1.65-3.29)	574
All Hispanics (2013 - 2014)	.443 (.399-.491)	.520 (.460-.570)	.860 (.770-.950)	1.28 (1.08-1.49)	1.68 (1.32-1.76)	703
All Hispanics (2015 - 2016)	.366 (.307-.436)	.380 (.200-.520)	.780 (.620-.920)	1.29 (1.05-1.58)	1.78 (1.42-2.03)	992
Asians (2011 - 2012)	*	< LOD	1.32 (1.19-1.54)	2.09 (1.71-2.56)	2.76 (2.24-3.64)	356
Asians (2013 - 2014)	.499 (.445-.559)	.570 (.430-.660)	.980 (.790-1.23)	1.58 (1.42-1.80)	2.04 (1.72-2.65)	291
Asians (2015 - 2016)	.486 (.412-.574)	.520 (.410-.640)	1.04 (.880-1.27)	1.89 (1.58-2.17)	2.31 (2.07-2.87)	334

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.89, 0.2, and 0.2, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Monomethylarsonic acid (creatinine corrected) (2003 – 2010)

CAS Number 65513-69-1

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	1.33 (1.18-1.54)	2.22 (1.82-2.57)	2.86 (2.40-3.53)	2567
Total population (2005 - 2006)	*	< LOD	1.28 (1.14-1.52)	2.37 (1.94-2.78)	3.13 (2.67-3.76)	2588
Total population (2007 - 2008)	*	< LOD	1.31 (1.23-1.42)	2.24 (2.00-2.56)	3.19 (2.78-3.58)	2576
Total population (2009 - 2010)	*	< LOD	1.36 (1.25-1.45)	2.16 (2.00-2.29)	2.91 (2.67-3.15)	2870
Age 6-11 years (2003 - 2004)	*	< LOD	1.63 (<LOD-1.81)	2.31 (1.88-2.50)	2.52 (2.31-3.07)	292
Age 6-11 years (2005 - 2006)	*	< LOD	1.44 (<LOD-1.83)	2.37 (1.65-3.20)	3.13 (2.29-4.92)	354
Age 6-11 years (2007 - 2008)	*	< LOD	1.69 (<LOD-2.06)	2.46 (2.09-2.91)	3.20 (2.56-4.32)	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	2.37 (2.07-2.78)	3.16 (2.55-3.76)	379
Age 12-19 years (2003 - 2004)	*	< LOD	1.10 (.853-1.23)	1.53 (1.30-1.85)	2.07 (1.71-2.22)	728
Age 12-19 years (2005 - 2006)	*	< LOD	1.05 (.930-1.14)	1.56 (1.49-1.73)	1.97 (1.78-2.13)	703
Age 12-19 years (2007 - 2008)	*	< LOD	.970 (.880-1.07)	1.45 (1.19-1.73)	1.97 (1.49-2.34)	366
Age 12-19 years (2009 - 2010)	*	< LOD	1.21 (1.02-1.45)	1.98 (1.60-2.56)	2.56 (1.94-4.57)	456
Age 20+ years (2003 - 2004)	*	< LOD	1.36 (1.18-1.58)	2.28 (1.82-2.79)	3.00 (2.43-3.53)	1547
Age 20+ years (2005 - 2006)	*	< LOD	1.31 (1.13-1.58)	2.46 (2.00-2.91)	3.20 (2.78-3.81)	1531
Age 20+ years (2007 - 2008)	*	< LOD	1.32 (1.23-1.45)	2.35 (2.02-2.67)	3.38 (2.78-3.83)	1820
Age 20+ years (2009 - 2010)	*	< LOD	1.36 (1.25-1.45)	2.18 (2.00-2.29)	2.91 (2.78-3.20)	2035
Males (2003 - 2004)	*	< LOD	1.20 (1.05-1.36)	1.88 (1.53-2.34)	2.50 (2.07-3.45)	1283
Males (2005 - 2006)	*	< LOD	1.11 (.950-1.28)	1.78 (1.47-2.29)	2.46 (1.88-3.32)	1276
Males (2007 - 2008)	*	< LOD	1.18 (1.07-1.26)	2.06 (1.85-2.34)	2.71 (2.46-3.37)	1289
Males (2009 - 2010)	*	< LOD	1.16 (1.07-1.25)	1.79 (1.64-1.99)	2.29 (2.08-2.78)	1402
Females (2003 - 2004)	*	< LOD	1.50 (<LOD-1.77)	2.40 (1.96-2.86)	3.00 (2.61-3.53)	1284
Females (2005 - 2006)	*	< LOD	1.58 (1.36-1.76)	2.78 (2.29-3.20)	3.56 (3.05-4.35)	1312
Females (2007 - 2008)	*	< LOD	1.45 (<LOD-1.60)	2.41 (1.94-2.91)	3.56 (2.78-4.27)	1287
Females (2009 - 2010)	*	< LOD	1.56 (<LOD-1.73)	2.46 (2.29-2.62)	3.37 (2.91-3.56)	1468
Mexican Americans (2003 - 2004)	*	< LOD	1.46 (1.11-1.93)	2.30 (1.84-3.00)	3.16 (2.40-3.85)	621
Mexican Americans (2005 - 2006)	*	< LOD	1.19 (1.08-1.35)	1.92 (1.60-2.13)	2.53 (2.06-2.91)	651
Mexican Americans (2007 - 2008)	*	< LOD	1.28 (1.10-1.60)	2.27 (1.64-2.71)	3.05 (2.35-3.76)	513
Mexican Americans (2009 - 2010)	*	< LOD	1.31 (<LOD-1.49)	2.00 (1.73-2.56)	3.05 (2.29-3.56)	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.816 (<LOD-.985)	1.37 (1.14-1.61)	1.88 (1.46-2.17)	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.790 (.720-.880)	1.11 (.980-1.34)	1.57 (1.23-1.98)	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.920 (.840-1.06)	1.45 (1.33-1.73)	2.09 (1.73-2.56)	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.970 (<LOD-1.08)	1.73 (1.39-1.94)	2.29 (1.83-2.91)	545
Non-Hispanic whites (2003 - 2004)	*	< LOD	1.33 (1.15-1.62)	2.28 (1.73-2.86)	2.86 (2.35-3.75)	1077
Non-Hispanic whites (2005 - 2006)	*	< LOD	1.35 (1.16-1.64)	2.50 (2.00-3.05)	3.20 (2.78-3.81)	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	1.35 (1.23-1.52)	2.37 (2.04-2.78)	3.37 (2.78-4.00)	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	1.36 (<LOD-1.52)	2.21 (1.99-2.37)	2.91 (2.67-3.20)	1226

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Monomethylarsonic acid (creatinine corrected) (2011 – 2016)

CAS Number 65513-69-1

Metabolite of Arsenic

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	2.21 (2.03-2.42)	2.86 (2.63-3.32)	2516
Total population (2013 - 2014)	.474 (.425-.527)	.489 (.424-.556)	.812 (.734-.904)	1.27 (1.17-1.40)	1.61 (1.45-1.84)	2653
Total population (2015 - 2016)	*	.378 (<LOD-.424)	.642 (.560-.734)	1.01 (.929-1.15)	1.31 (1.24-1.41)	3091
Age 3-5 years (2015 - 2016)	*	< LOD	1.02 (.845-1.27)	1.71 (1.40-2.00)	2.16 (1.75-2.76)	506
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	2.55 (2.17-3.15)	3.32 (2.52-4.50)	401
Age 6-11 years (2013 - 2014)	*	.543 (<LOD-.667)	.933 (.700-1.15)	1.43 (1.08-1.87)	1.71 (1.44-2.22)	397
Age 6-11 years (2015 - 2016)	*	.418 (<LOD-.483)	.687 (.583-.756)	1.24 (.927-1.57)	1.60 (1.23-1.78)	380
Age 12-19 years (2011 - 2012)	*	< LOD	1.07 (<LOD-1.24)	1.75 (1.30-2.42)	2.52 (1.62-7.00)	392
Age 12-19 years (2013 - 2014)	.459 (.397-.530)	.462 (.362-.603)	.727 (.634-.848)	1.10 (.877-1.50)	1.51 (1.11-2.00)	450
Age 12-19 years (2015 - 2016)	.343 (.289-.407)	.339 (.285-.403)	.582 (.487-.696)	.919 (.730-1.17)	1.20 (.981-1.35)	402
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	2.25 (2.00-2.42)	2.74 (2.52-3.32)	1723
Age 20+ years (2013 - 2014)	.471 (.423-.524)	.488 (.424-.545)	.815 (.740-.900)	1.28 (1.18-1.38)	1.62 (1.44-1.82)	1806
Age 20+ years (2015 - 2016)	*	.378 (<LOD-.420)	.636 (.538-.727)	1.00 (.908-1.13)	1.26 (1.19-1.36)	1803
Males (2011 - 2012)	*	< LOD	1.13 (<LOD-1.24)	1.72 (1.58-1.85)	2.31 (1.92-2.67)	1263
Males (2013 - 2014)	.456 (.413-.504)	.475 (.421-.535)	.772 (.695-.851)	1.20 (1.09-1.30)	1.56 (1.38-1.69)	1307
Males (2015 - 2016)	*	.361 (.309-.416)	.626 (.516-.727)	.951 (.846-1.08)	1.23 (1.08-1.41)	1537
Females (2011 - 2012)	*	< LOD	< LOD	2.52 (2.27-2.74)	3.32 (2.74-3.94)	1253
Females (2013 - 2014)	.491 (.435-.555)	.500 (.424-.583)	.842 (.741-1.00)	1.33 (1.18-1.46)	1.68 (1.41-2.08)	1346
Females (2015 - 2016)	*	.398 (<LOD-.441)	.682 (.560-.741)	1.11 (.928-1.27)	1.36 (1.25-1.58)	1554
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	1.95 (1.54-2.25)	2.63 (1.85-3.32)	317
Mexican Americans (2013 - 2014)	.463 (.409-.524)	.488 (.438-.554)	.743 (.674-.850)	1.20 (1.01-1.33)	1.49 (1.31-1.66)	455
Mexican Americans (2015 - 2016)	*	.354 (<LOD-.432)	.682 (.548-.768)	1.00 (.824-1.41)	1.41 (1.01-1.78)	590
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	1.38 (1.21-1.62)	1.97 (1.75-2.33)	672
Non-Hispanic blacks (2013 - 2014)	.336 (.296-.382)	.329 (.294-.392)	.557 (.486-.631)	.806 (.735-.910)	1.06 (.910-1.25)	576
Non-Hispanic blacks (2015 - 2016)	*	.313 (<LOD-.414)	.545 (.440-.677)	.841 (.737-.933)	1.07 (.873-1.30)	676
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	2.33 (2.03-2.52)	2.86 (2.52-3.50)	824
Non-Hispanic whites (2013 - 2014)	.481 (.423-.546)	.495 (.418-.568)	.824 (.733-.933)	1.25 (1.10-1.42)	1.56 (1.36-1.84)	979
Non-Hispanic whites (2015 - 2016)	*	.378 (<LOD-.412)	.571 (.508-.682)	.933 (.778-1.08)	1.20 (1.02-1.36)	937
All Hispanics (2011 - 2012)	*	< LOD	1.34 (<LOD-1.48)	2.02 (1.62-2.52)	2.63 (1.97-3.50)	574
All Hispanics (2013 - 2014)	.494 (.446-.548)	.520 (.467-.586)	.819 (.713-.931)	1.31 (1.18-1.50)	1.71 (1.49-1.97)	703
All Hispanics (2015 - 2016)	.411 (.353-.478)	.410 (.341-.521)	.767 (.650-.907)	1.18 (1.02-1.37)	1.58 (1.30-1.83)	991
Asians (2011 - 2012)	*	< LOD	2.06 (1.63-2.33)	3.07 (2.69-3.68)	4.50 (3.43-5.09)	356
Asians (2013 - 2014)	.777 (.667-.906)	.800 (.623-1.04)	1.33 (1.08-1.61)	1.94 (1.56-2.53)	2.54 (2.00-3.16)	291
Asians (2015 - 2016)	.660 (.562-.775)	.740 (.565-.828)	1.19 (1.04-1.40)	2.00 (1.42-2.56)	2.56 (2.00-3.15)	334

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Trimethylarsine oxide (2003 – 2010)

CAS Number 4964-14-1

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2568
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2588
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2871
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	292
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	354
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	380
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	728
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	703
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	456
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1548
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1531
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1820
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2035
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1276
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1403
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1312
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1468
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	621
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	651
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	513
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	546
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1078
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1226

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 1.0, 1.0, 1.0, and 1.0 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Trimethylarsine oxide (2011 – 2012)‡

CAS Number 4964-14-1

Geometric mean and selected percentiles of urine concentrations (in µg As/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2517
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	.300 (<LOD-.960)	401
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	392
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1724
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1264
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1253
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	317
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	672
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	825
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	574
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	356

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.25.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Trimethylarsine oxide (creatinine corrected) (2003 – 2010)

CAS Number 4964-14-1

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2568
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2588
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2870
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	292
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	354
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	390
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	379
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	728
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	703
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	366
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	456
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1548
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1531
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1820
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2035
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1276
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1289
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1402
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1284
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1312
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1468
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	621
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	651
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	513
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	618
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	725
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	545
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1078
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1050
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1063
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1226

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Trimethylarsine oxide (creatinine corrected) (2011 – 2012)‡

CAS Number 4964-14-1

Geometric mean and selected percentiles of urine concentrations (in µg As/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2516
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	1.06 (<LOD-1.39)	401
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	392
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1723
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1263
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1253
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	317
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	672
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	824
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	574
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	356

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Arsenic_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Arsenic_FactSheet.html

Urinary Barium (1999 – 2010)

CAS Number 81-25-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	1.50 (1.35-1.66)	1.60 (1.50-1.90)	3.10 (2.70-3.40)	5.40 (4.60-6.10)	6.90 (6.20-8.40)	2180
Total population (2001 - 2002)	1.52 (1.41-1.65)	1.63 (1.50-1.76)	3.12 (2.77-3.51)	5.24 (4.73-5.84)	7.48 (6.54-8.12)	2690
Total population (2003 - 2004)	1.49 (1.36-1.64)	1.51 (1.35-1.72)	2.91 (2.64-3.28)	5.36 (4.86-5.71)	7.54 (6.93-8.63)	2558
Total population (2005 - 2006)	1.52 (1.39-1.66)	1.58 (1.44-1.70)	2.99 (2.63-3.41)	5.34 (4.82-5.83)	7.10 (6.46-8.18)	2576
Total population (2007 - 2008)	1.56 (1.45-1.69)	1.64 (1.49-1.80)	3.01 (2.72-3.34)	4.93 (4.39-5.69)	7.04 (6.07-8.20)	2627
Total population (2009 - 2010)	1.47 (1.34-1.60)	1.48 (1.35-1.62)	2.81 (2.52-3.06)	4.66 (4.34-5.35)	6.78 (5.86-7.76)	2848
Age 6-11 years (1999 - 2000)	2.15 (1.70-2.72)	2.20 (1.90-2.50)	4.00 (2.60-6.10)	6.40 (5.20-8.30)	8.30 (5.00-76.2)	297
Age 6-11 years (2001 - 2002)	1.80 (1.44-2.26)	2.09 (1.74-2.49)	3.63 (2.86-4.39)	5.37 (4.26-7.38)	6.88 (5.37-8.49)	368
Age 6-11 years (2003 - 2004)	2.21 (1.81-2.71)	2.50 (1.81-2.75)	4.76 (3.80-5.65)	8.63 (5.59-11.8)	11.8 (6.87-14.8)	290
Age 6-11 years (2005 - 2006)	1.73 (1.53-1.97)	1.87 (1.61-2.03)	3.55 (2.41-4.30)	6.21 (4.30-7.32)	7.72 (6.26-8.92)	355
Age 6-11 years (2007 - 2008)	1.75 (1.50-2.04)	1.86 (1.58-2.23)	3.41 (2.85-3.79)	5.57 (4.49-6.59)	7.32 (5.71-9.18)	394
Age 6-11 years (2009 - 2010)	1.49 (1.28-1.74)	1.50 (1.22-1.68)	2.72 (2.19-3.13)	4.63 (4.02-5.37)	6.59 (5.24-7.72)	378
Age 12-19 years (1999 - 2000)	1.97 (1.78-2.19)	2.00 (1.70-2.30)	3.50 (3.10-4.00)	5.90 (4.80-7.00)	9.70 (5.90-13.1)	621
Age 12-19 years (2001 - 2002)	2.03 (1.76-2.34)	2.27 (1.96-2.53)	4.11 (3.48-4.72)	6.73 (5.55-7.87)	9.02 (7.25-11.4)	762
Age 12-19 years (2003 - 2004)	2.16 (1.93-2.41)	2.35 (2.06-2.63)	4.11 (3.48-4.71)	7.18 (6.00-8.29)	9.63 (8.15-11.4)	725
Age 12-19 years (2005 - 2006)	2.16 (1.92-2.42)	2.33 (1.99-2.56)	3.80 (3.60-4.21)	6.35 (5.48-7.49)	8.24 (6.06-10.5)	701
Age 12-19 years (2007 - 2008)	2.18 (1.99-2.39)	2.31 (2.07-2.59)	3.62 (3.34-4.10)	6.19 (4.75-7.51)	8.20 (6.22-11.1)	376
Age 12-19 years (2009 - 2010)	1.79 (1.52-2.09)	1.90 (1.46-2.45)	3.25 (2.82-4.14)	5.43 (4.45-6.07)	6.87 (5.73-8.16)	451
Age 20+ years (1999 - 2000)	1.36 (1.24-1.51)	1.50 (1.30-1.70)	2.80 (2.60-3.20)	5.10 (4.30-5.50)	6.40 (5.70-8.40)	1262
Age 20+ years (2001 - 2002)	1.43 (1.32-1.54)	1.50 (1.39-1.65)	2.85 (2.55-3.27)	4.86 (4.53-5.47)	7.14 (6.08-8.12)	1560
Age 20+ years (2003 - 2004)	1.34 (1.20-1.50)	1.39 (1.19-1.56)	2.54 (2.21-2.91)	4.61 (3.99-5.30)	6.61 (5.57-7.43)	1543
Age 20+ years (2005 - 2006)	1.42 (1.28-1.57)	1.43 (1.28-1.63)	2.75 (2.47-3.11)	5.12 (4.45-5.81)	6.83 (6.14-7.90)	1520
Age 20+ years (2007 - 2008)	1.46 (1.35-1.58)	1.51 (1.39-1.67)	2.79 (2.54-3.15)	4.61 (4.19-5.42)	6.80 (5.50-8.37)	1857
Age 20+ years (2009 - 2010)	1.42 (1.30-1.55)	1.43 (1.31-1.58)	2.67 (2.36-3.02)	4.58 (4.22-5.14)	6.80 (5.70-8.63)	2019
Males (1999 - 2000)	1.70 (1.54-1.88)	1.90 (1.80-2.00)	3.20 (3.00-3.60)	5.50 (4.20-6.70)	7.50 (5.90-9.70)	1083
Males (2001 - 2002)	1.64 (1.47-1.82)	1.80 (1.65-1.98)	3.15 (2.76-3.73)	5.52 (4.82-6.35)	7.87 (6.49-9.32)	1335
Males (2003 - 2004)	1.62 (1.47-1.78)	1.69 (1.49-1.85)	3.09 (2.81-3.54)	5.65 (5.14-6.16)	8.56 (6.71-9.67)	1281
Males (2005 - 2006)	1.66 (1.48-1.85)	1.71 (1.50-1.94)	3.21 (2.76-3.79)	5.48 (4.68-6.22)	7.10 (6.18-8.84)	1271
Males (2007 - 2008)	1.62 (1.48-1.77)	1.80 (1.57-1.93)	3.14 (2.79-3.42)	5.00 (4.31-5.70)	6.84 (5.83-7.72)	1327
Males (2009 - 2010)	1.53 (1.35-1.74)	1.57 (1.36-1.82)	3.01 (2.53-3.36)	4.83 (4.25-5.77)	6.81 (5.77-8.76)	1398
Females (1999 - 2000)	1.33 (1.15-1.53)	1.50 (1.20-1.60)	2.80 (2.30-3.30)	5.20 (4.20-5.90)	6.80 (5.60-10.4)	1097
Females (2001 - 2002)	1.43 (1.30-1.56)	1.44 (1.29-1.63)	3.11 (2.74-3.43)	4.93 (4.44-5.88)	7.15 (6.32-7.86)	1355
Females (2003 - 2004)	1.38 (1.24-1.54)	1.39 (1.18-1.57)	2.71 (2.41-3.15)	4.95 (4.29-5.51)	6.87 (5.65-8.10)	1277
Females (2005 - 2006)	1.40 (1.27-1.54)	1.42 (1.30-1.63)	2.70 (2.39-3.19)	5.21 (4.65-5.71)	7.09 (6.24-7.94)	1305
Females (2007 - 2008)	1.51 (1.36-1.68)	1.54 (1.38-1.70)	2.84 (2.52-3.37)	4.87 (4.23-6.13)	7.18 (5.94-8.83)	1300
Females (2009 - 2010)	1.40 (1.30-1.51)	1.38 (1.31-1.47)	2.61 (2.41-2.90)	4.58 (4.33-4.95)	6.59 (5.37-7.86)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.12, 0.12, 0.31, 0.12, 0.12, and 0.12 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Barium_BiomonitoringSummary.html

Urinary Barium (1999 – 2010)

CAS Number 81-25-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	1.35 (1.25-1.46)	1.40 (1.20-1.50)	2.60 (2.30-2.90)	4.50 (4.10-5.30)	6.30 (5.50-6.80)	692
Mexican Americans (2001 - 2002)	1.21 (1.06-1.37)	1.25 (1.11-1.46)	2.56 (2.04-2.91)	4.35 (3.65-5.49)	6.43 (5.21-8.22)	683
Mexican Americans (2003 - 2004)	1.40 (1.15-1.70)	1.45 (1.22-1.73)	2.62 (1.78-3.38)	4.07 (2.95-6.37)	6.01 (4.01-7.88)	618
Mexican Americans (2005 - 2006)	1.33 (1.24-1.42)	1.36 (1.22-1.50)	2.63 (2.35-2.89)	4.47 (3.80-5.23)	6.21 (5.23-7.00)	652
Mexican Americans (2007 - 2008)	1.33 (1.16-1.53)	1.37 (1.19-1.48)	2.60 (2.29-2.84)	4.21 (3.53-4.90)	5.79 (4.90-8.00)	515
Mexican Americans (2009 - 2010)	1.24 (1.07-1.45)	1.18 (1.05-1.40)	2.25 (1.88-2.71)	4.15 (3.55-5.40)	6.35 (5.00-8.75)	613
Non-Hispanic blacks (1999 - 2000)	1.34 (1.12-1.62)	1.40 (1.20-1.60)	2.50 (2.30-2.90)	5.10 (3.70-6.60)	7.40 (5.40-13.9)	540
Non-Hispanic blacks (2001 - 2002)	1.30 (1.14-1.48)	1.42 (1.22-1.62)	2.61 (2.31-2.82)	4.30 (3.70-5.18)	5.99 (4.87-7.26)	667
Non-Hispanic blacks (2003 - 2004)	1.27 (1.17-1.39)	1.38 (1.26-1.48)	2.34 (2.05-2.59)	3.77 (3.35-4.36)	5.86 (4.76-7.45)	723
Non-Hispanic blacks (2005 - 2006)	1.25 (1.15-1.37)	1.31 (1.21-1.41)	2.40 (2.22-2.61)	4.24 (3.69-4.83)	6.19 (5.23-6.96)	692
Non-Hispanic blacks (2007 - 2008)	1.17 (1.07-1.28)	1.23 (1.12-1.37)	2.14 (2.01-2.34)	3.70 (3.27-4.00)	5.00 (3.93-5.90)	589
Non-Hispanic blacks (2009 - 2010)	1.22 (1.08-1.38)	1.22 (1.07-1.38)	2.13 (1.91-2.51)	3.76 (3.09-4.88)	5.50 (4.06-7.32)	544
Non-Hispanic whites (1999 - 2000)	1.56 (1.36-1.80)	1.80 (1.60-2.00)	3.30 (2.80-3.70)	5.50 (4.50-6.30)	7.50 (6.20-8.80)	765
Non-Hispanic whites (2001 - 2002)	1.61 (1.46-1.77)	1.68 (1.54-1.85)	3.31 (2.87-3.74)	5.66 (4.94-6.30)	7.73 (6.61-8.49)	1132
Non-Hispanic whites (2003 - 2004)	1.56 (1.37-1.78)	1.61 (1.28-1.92)	3.12 (2.75-3.70)	5.57 (5.04-6.43)	8.08 (6.87-9.53)	1074
Non-Hispanic whites (2005 - 2006)	1.59 (1.42-1.78)	1.66 (1.50-1.86)	3.08 (2.63-3.79)	5.50 (4.90-6.08)	7.10 (6.46-8.24)	1041
Non-Hispanic whites (2007 - 2008)	1.71 (1.55-1.88)	1.82 (1.62-1.97)	3.36 (2.91-3.71)	5.38 (4.51-6.30)	7.18 (6.22-9.05)	1095
Non-Hispanic whites (2009 - 2010)	1.56 (1.42-1.73)	1.60 (1.40-1.76)	3.00 (2.64-3.36)	4.89 (4.48-5.84)	7.16 (6.12-9.31)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.12, 0.12, 0.31, 0.12, 0.12, and 0.12 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Barium_BiomonitoringSummary.html

Urinary Barium (2011 – 2016)

CAS Number 81-25-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.19 (1.11-1.28)	1.23 (1.14-1.33)	2.40 (2.24-2.54)	4.04 (3.76-4.35)	5.52 (4.92-5.95)	2504
Total population (2013 - 2014)	1.09 (1.03-1.16)	1.10 (.980-1.21)	2.17 (2.05-2.31)	4.01 (3.61-4.28)	5.67 (5.29-6.09)	2664
Total population (2015 - 2016)	1.15 (1.08-1.22)	1.21 (1.13-1.30)	2.26 (2.08-2.51)	3.89 (3.66-4.16)	5.59 (4.99-6.19)	3061
Age 3-5 years (2015 - 2016)	.954 (.875-1.04)	1.06 (.950-1.26)	2.04 (1.85-2.41)	3.28 (2.87-4.13)	4.59 (3.56-6.06)	486
Age 6-11 years (2011 - 2012)	1.39 (1.24-1.55)	1.46 (1.21-1.62)	2.96 (2.33-3.52)	4.92 (4.52-5.29)	6.68 (5.25-7.92)	399
Age 6-11 years (2013 - 2014)	1.13 (.962-1.33)	1.20 (.970-1.43)	2.06 (1.73-2.64)	3.48 (2.64-5.02)	5.02 (2.96-9.85)	402
Age 6-11 years (2015 - 2016)	1.30 (1.17-1.45)	1.41 (1.18-1.63)	2.65 (2.30-2.87)	4.04 (3.40-5.61)	6.16 (4.69-7.46)	379
Age 12-19 years (2011 - 2012)	1.52 (1.25-1.84)	1.61 (1.24-1.90)	2.98 (2.40-4.03)	5.37 (4.27-6.08)	6.63 (5.53-8.77)	390
Age 12-19 years (2013 - 2014)	1.43 (1.19-1.70)	1.49 (1.10-1.75)	2.78 (2.23-3.49)	5.67 (4.18-6.69)	6.92 (6.14-8.11)	451
Age 12-19 years (2015 - 2016)	1.45 (1.25-1.68)	1.47 (1.26-1.77)	2.93 (2.37-3.45)	4.95 (3.90-6.02)	7.56 (5.78-9.20)	402
Age 20+ years (2011 - 2012)	1.13 (1.06-1.21)	1.19 (1.09-1.27)	2.24 (2.09-2.44)	3.74 (3.39-4.01)	5.05 (4.37-5.78)	1715
Age 20+ years (2013 - 2014)	1.05 (.989-1.11)	1.03 (.930-1.16)	2.13 (1.93-2.31)	3.88 (3.33-4.25)	5.60 (4.78-5.96)	1811
Age 20+ years (2015 - 2016)	1.10 (1.03-1.18)	1.17 (1.07-1.28)	2.15 (2.02-2.33)	3.73 (3.42-3.99)	5.39 (4.55-5.60)	1794
Males (2011 - 2012)	1.29 (1.20-1.38)	1.30 (1.24-1.41)	2.52 (2.25-2.71)	4.29 (3.74-4.58)	5.96 (4.49-7.35)	1262
Males (2013 - 2014)	1.20 (1.10-1.31)	1.24 (1.05-1.43)	2.38 (2.09-2.68)	4.27 (3.76-4.95)	5.96 (5.60-6.69)	1318
Males (2015 - 2016)	1.29 (1.17-1.43)	1.38 (1.23-1.56)	2.56 (2.10-2.93)	4.16 (3.72-4.99)	6.06 (5.17-7.67)	1524
Females (2011 - 2012)	1.11 (.989-1.25)	1.14 (1.00-1.35)	2.33 (2.06-2.57)	3.90 (3.34-4.35)	5.13 (4.44-5.57)	1242
Females (2013 - 2014)	.998 (.940-1.06)	.980 (.870-1.12)	2.03 (1.85-2.19)	3.66 (3.21-4.07)	5.19 (4.42-5.74)	1346
Females (2015 - 2016)	1.03 (.953-1.11)	1.04 (.980-1.12)	2.08 (1.94-2.24)	3.66 (3.25-3.96)	4.99 (4.46-5.61)	1537
Mexican Americans (2011 - 2012)	1.08 (.961-1.22)	1.06 (.910-1.23)	2.10 (1.79-2.57)	3.95 (3.24-4.86)	5.58 (4.10-7.22)	317
Mexican Americans (2013 - 2014)	.938 (.853-1.03)	.870 (.760-1.02)	2.00 (1.61-2.25)	3.15 (2.84-3.53)	4.19 (3.48-4.95)	453
Mexican Americans (2015 - 2016)	.974 (.873-1.09)	1.03 (.880-1.20)	1.87 (1.63-2.22)	3.55 (2.93-4.35)	4.71 (3.98-5.61)	585
Non-Hispanic blacks (2011 - 2012)	.997 (.891-1.12)	1.05 (.910-1.20)	2.08 (1.79-2.29)	3.63 (3.09-4.08)	4.68 (4.02-5.19)	669
Non-Hispanic blacks (2013 - 2014)	.947 (.865-1.04)	.940 (.860-1.06)	1.81 (1.59-2.08)	3.48 (2.94-4.01)	4.50 (3.92-5.95)	581
Non-Hispanic blacks (2015 - 2016)	.981 (.844-1.14)	1.05 (.910-1.19)	1.95 (1.72-2.44)	3.40 (2.83-4.19)	4.63 (4.16-5.55)	671
Non-Hispanic whites (2011 - 2012)	1.27 (1.17-1.38)	1.32 (1.22-1.43)	2.50 (2.25-2.71)	4.33 (3.63-4.81)	5.57 (4.87-6.35)	820
Non-Hispanic whites (2013 - 2014)	1.18 (1.10-1.26)	1.20 (1.05-1.35)	2.32 (2.16-2.53)	4.27 (3.74-4.94)	5.99 (5.57-6.44)	985
Non-Hispanic whites (2015 - 2016)	1.25 (1.14-1.37)	1.30 (1.18-1.45)	2.45 (2.11-2.84)	3.97 (3.68-4.59)	5.67 (4.76-7.12)	924
All Hispanics (2011 - 2012)	1.08 (.970-1.19)	1.07 (.940-1.23)	2.15 (1.86-2.47)	3.74 (2.99-4.34)	4.82 (3.96-5.98)	573
All Hispanics (2013 - 2014)	.927 (.840-1.03)	.890 (.760-1.05)	1.92 (1.72-2.14)	3.15 (2.84-3.53)	4.25 (3.60-4.82)	701
All Hispanics (2015 - 2016)	.951 (.875-1.03)	1.00 (.880-1.14)	1.98 (1.72-2.20)	3.51 (2.93-4.15)	4.96 (4.22-5.94)	982
Asians (2011 - 2012)	1.16 (1.03-1.30)	1.21 (1.02-1.35)	2.28 (1.94-2.67)	3.90 (3.20-4.47)	5.50 (4.01-6.40)	353
Asians (2013 - 2014)	.962 (.831-1.12)	.920 (.790-1.13)	1.93 (1.47-2.33)	3.79 (2.95-4.75)	5.67 (4.19-6.61)	292
Asians (2015 - 2016)	1.00 (.919-1.09)	1.00 (.830-1.13)	1.99 (1.77-2.27)	3.73 (3.06-4.78)	5.24 (3.50-8.42)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.1, 0.06, and 0.06, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Barium_BiomonitoringSummary.html

Urinary Barium (creatinine corrected) (1999 – 2010)

CAS Number 81-25-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	1.40 (1.26-1.56)	1.41 (1.28-1.54)	2.54 (2.20-2.91)	4.68 (3.85-5.47)	6.33 (5.47-8.09)	2180
Total population (2001 - 2002)	1.44 (1.31-1.58)	1.49 (1.35-1.63)	2.76 (2.51-3.03)	4.58 (4.15-4.96)	6.24 (5.28-7.27)	2689
Total population (2003 - 2004)	1.48 (1.37-1.60)	1.41 (1.31-1.58)	2.68 (2.44-2.89)	4.92 (4.39-5.45)	7.10 (6.29-7.77)	2558
Total population (2005 - 2006)	1.50 (1.40-1.61)	1.48 (1.37-1.61)	2.75 (2.50-3.03)	4.65 (4.09-5.10)	6.38 (5.62-7.56)	2576
Total population (2007 - 2008)	1.63 (1.51-1.75)	1.60 (1.51-1.72)	2.92 (2.72-3.16)	4.85 (4.40-5.57)	7.20 (5.94-8.59)	2627
Total population (2009 - 2010)	1.56 (1.45-1.68)	1.55 (1.42-1.64)	2.72 (2.54-2.97)	4.69 (4.12-5.16)	6.24 (5.60-7.43)	2848
Age 6-11 years (1999 - 2000)	2.37 (1.68-3.32)	2.38 (1.84-2.92)	4.47 (2.55-6.46)	10.2 (3.75-22.0)	11.4 (5.46-22.0)	297
Age 6-11 years (2001 - 2002)	2.20 (1.91-2.52)	2.41 (2.19-2.83)	3.91 (3.29-4.51)	5.01 (4.58-6.00)	6.71 (5.20-8.47)	368
Age 6-11 years (2003 - 2004)	2.58 (2.22-2.99)	3.00 (2.35-3.29)	4.45 (3.57-5.54)	6.69 (5.59-7.70)	10.3 (6.53-21.0)	290
Age 6-11 years (2005 - 2006)	2.14 (1.85-2.48)	2.15 (1.76-2.51)	3.83 (3.10-4.73)	6.19 (4.84-7.83)	10.0 (5.76-11.1)	355
Age 6-11 years (2007 - 2008)	2.28 (2.04-2.54)	2.41 (2.05-2.59)	4.43 (3.87-4.70)	6.58 (5.05-9.46)	9.89 (7.13-13.3)	394
Age 6-11 years (2009 - 2010)	2.03 (1.78-2.30)	2.00 (1.77-2.40)	3.33 (2.81-3.79)	5.04 (4.17-7.39)	8.76 (5.93-10.8)	378
Age 12-19 years (1999 - 2000)	1.51 (1.34-1.70)	1.40 (1.26-1.59)	2.48 (1.97-3.06)	4.36 (3.23-5.39)	7.62 (4.24-11.4)	621
Age 12-19 years (2001 - 2002)	1.45 (1.33-1.59)	1.56 (1.31-1.77)	2.89 (2.68-3.12)	4.52 (3.84-5.20)	5.55 (4.81-6.10)	762
Age 12-19 years (2003 - 2004)	1.54 (1.36-1.75)	1.59 (1.39-1.87)	2.60 (2.24-3.48)	4.97 (4.34-5.58)	6.47 (5.38-7.77)	725
Age 12-19 years (2005 - 2006)	1.66 (1.50-1.84)	1.73 (1.52-1.93)	3.15 (2.76-3.42)	4.25 (3.88-4.56)	5.00 (4.46-6.68)	701
Age 12-19 years (2007 - 2008)	1.71 (1.52-1.92)	1.70 (1.48-1.96)	3.03 (2.51-3.65)	4.80 (3.96-5.47)	6.17 (4.80-8.12)	376
Age 12-19 years (2009 - 2010)	1.67 (1.48-1.88)	1.66 (1.54-1.84)	2.69 (2.24-3.18)	3.98 (3.40-5.29)	6.42 (4.61-9.33)	451
Age 20+ years (1999 - 2000)	1.30 (1.19-1.42)	1.33 (1.20-1.46)	2.32 (2.08-2.62)	4.29 (3.63-4.96)	5.65 (5.28-6.33)	1262
Age 20+ years (2001 - 2002)	1.37 (1.24-1.50)	1.40 (1.24-1.52)	2.53 (2.23-2.84)	4.38 (4.02-5.00)	6.55 (5.00-7.64)	1559
Age 20+ years (2003 - 2004)	1.38 (1.26-1.50)	1.32 (1.22-1.41)	2.39 (2.13-2.70)	4.39 (3.77-5.16)	7.00 (5.45-8.50)	1543
Age 20+ years (2005 - 2006)	1.42 (1.30-1.54)	1.39 (1.26-1.55)	2.59 (2.33-2.82)	4.53 (3.65-5.40)	6.34 (5.37-7.67)	1520
Age 20+ years (2007 - 2008)	1.56 (1.44-1.69)	1.55 (1.40-1.66)	2.80 (2.55-3.04)	4.64 (4.05-5.43)	7.20 (5.78-8.65)	1857
Age 20+ years (2009 - 2010)	1.50 (1.40-1.61)	1.46 (1.38-1.55)	2.67 (2.42-2.92)	4.71 (4.07-5.23)	6.03 (5.53-7.34)	2019
Males (1999 - 2000)	1.32 (1.22-1.42)	1.36 (1.23-1.47)	2.39 (2.11-2.57)	4.24 (3.48-5.00)	5.61 (4.39-10.2)	1083
Males (2001 - 2002)	1.30 (1.16-1.45)	1.34 (1.19-1.50)	2.46 (2.14-2.83)	4.51 (3.73-4.96)	5.42 (4.81-7.51)	1334
Males (2003 - 2004)	1.36 (1.26-1.47)	1.31 (1.19-1.43)	2.60 (2.37-2.75)	4.36 (3.97-4.72)	6.01 (5.45-6.96)	1281
Males (2005 - 2006)	1.36 (1.23-1.50)	1.38 (1.25-1.52)	2.36 (2.19-2.73)	4.24 (3.65-4.82)	5.69 (4.75-7.36)	1271
Males (2007 - 2008)	1.45 (1.34-1.55)	1.50 (1.32-1.60)	2.59 (2.34-2.79)	4.30 (3.84-4.72)	5.56 (5.05-6.30)	1327
Males (2009 - 2010)	1.40 (1.28-1.52)	1.38 (1.29-1.50)	2.39 (2.13-2.68)	4.05 (3.52-4.71)	5.55 (4.89-6.77)	1398
Females (1999 - 2000)	1.49 (1.27-1.74)	1.48 (1.29-1.68)	2.65 (2.13-3.46)	4.91 (3.96-6.38)	7.36 (5.25-11.3)	1097
Females (2001 - 2002)	1.59 (1.45-1.75)	1.64 (1.48-1.79)	2.98 (2.75-3.30)	4.76 (4.38-5.31)	6.97 (5.86-7.52)	1355
Females (2003 - 2004)	1.60 (1.45-1.77)	1.55 (1.35-1.73)	2.78 (2.34-3.25)	5.50 (4.43-6.86)	7.88 (6.28-11.5)	1277
Females (2005 - 2006)	1.65 (1.54-1.76)	1.63 (1.45-1.83)	3.09 (2.71-3.38)	4.87 (4.48-5.65)	7.48 (6.04-10.0)	1305
Females (2007 - 2008)	1.83 (1.63-2.05)	1.74 (1.52-2.06)	3.22 (2.82-3.89)	5.94 (4.57-7.38)	8.15 (7.18-9.49)	1300
Females (2009 - 2010)	1.73 (1.60-1.87)	1.71 (1.62-1.86)	3.06 (2.72-3.41)	5.06 (4.59-5.74)	6.58 (5.88-8.19)	1450

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Barium_BiomonitoringSummary.html

Urinary Barium (creatinine corrected) (1999 – 2010)

CAS Number 81-25-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	1.21 (1.10-1.33)	1.18 (1.05-1.38)	2.39 (2.10-2.59)	4.00 (3.33-4.80)	5.31 (4.80-6.51)	692
Mexican Americans (2001 - 2002)	1.18 (1.03-1.34)	1.16 (1.00-1.38)	2.33 (1.90-2.61)	3.68 (3.29-4.10)	4.96 (4.24-6.80)	682
Mexican Americans (2003 - 2004)	1.29 (1.08-1.55)	1.28 (1.03-1.53)	2.25 (1.73-2.97)	3.99 (2.79-5.03)	4.99 (4.24-6.56)	618
Mexican Americans (2005 - 2006)	1.25 (1.17-1.33)	1.21 (1.09-1.33)	2.27 (1.84-2.61)	3.66 (3.07-4.35)	5.11 (4.00-5.95)	652
Mexican Americans (2007 - 2008)	1.33 (1.16-1.53)	1.28 (1.14-1.49)	2.40 (1.87-2.90)	4.23 (3.45-4.87)	6.18 (4.75-7.27)	515
Mexican Americans (2009 - 2010)	1.30 (1.18-1.44)	1.26 (1.14-1.41)	2.33 (1.98-2.79)	3.55 (3.11-4.42)	5.50 (4.27-6.58)	613
Non-Hispanic blacks (1999 - 2000)	.881 (.703-1.11)	.905 (.710-1.06)	1.64 (1.36-2.00)	3.27 (2.26-4.76)	4.84 (3.57-10.8)	540
Non-Hispanic blacks (2001 - 2002)	.891 (.777-1.02)	.921 (.754-1.11)	1.64 (1.44-2.03)	2.86 (2.48-3.37)	4.02 (3.52-4.68)	667
Non-Hispanic blacks (2003 - 2004)	.915 (.832-1.01)	.963 (.880-1.04)	1.51 (1.39-1.75)	2.62 (2.29-3.04)	3.76 (3.22-4.72)	723
Non-Hispanic blacks (2005 - 2006)	.909 (.845-.979)	.880 (.820-.970)	1.78 (1.56-1.97)	2.99 (2.63-3.14)	3.91 (3.39-4.73)	692
Non-Hispanic blacks (2007 - 2008)	.858 (.807-.913)	.850 (.790-.920)	1.53 (1.34-1.61)	2.51 (2.01-3.03)	3.43 (2.83-5.05)	589
Non-Hispanic blacks (2009 - 2010)	.965 (.853-1.09)	.930 (.860-1.05)	1.63 (1.40-1.85)	2.92 (2.33-3.34)	3.71 (3.24-4.69)	544
Non-Hispanic whites (1999 - 2000)	1.56 (1.38-1.77)	1.55 (1.36-1.74)	2.72 (2.27-3.24)	5.00 (3.81-6.02)	6.60 (5.52-10.2)	765
Non-Hispanic whites (2001 - 2002)	1.62 (1.49-1.76)	1.66 (1.49-1.82)	3.04 (2.76-3.32)	4.96 (4.55-5.41)	6.74 (5.57-7.64)	1132
Non-Hispanic whites (2003 - 2004)	1.64 (1.49-1.82)	1.60 (1.40-1.76)	2.88 (2.56-3.26)	5.38 (4.67-6.28)	7.57 (6.69-9.27)	1074
Non-Hispanic whites (2005 - 2006)	1.65 (1.52-1.80)	1.61 (1.46-1.83)	2.95 (2.70-3.26)	4.82 (4.32-5.65)	7.21 (5.69-8.51)	1041
Non-Hispanic whites (2007 - 2008)	1.91 (1.74-2.10)	1.85 (1.65-2.09)	3.22 (2.84-3.76)	5.42 (4.55-6.91)	7.81 (6.33-9.45)	1095
Non-Hispanic whites (2009 - 2010)	1.75 (1.59-1.92)	1.70 (1.58-1.86)	2.99 (2.67-3.33)	5.00 (4.14-5.69)	6.63 (5.69-8.50)	1225

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Barium_BiomonitoringSummary.html

Urinary Barium (creatinine corrected) (2011 – 2016)

CAS Number 81-25-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.35 (1.24-1.48)	1.38 (1.27-1.47)	2.44 (2.10-2.84)	4.19 (3.72-4.85)	6.27 (5.20-6.66)	2502
Total population (2013 - 2014)	1.26 (1.19-1.34)	1.24 (1.13-1.38)	2.33 (2.18-2.50)	4.06 (3.75-4.26)	5.59 (5.02-6.06)	2663
Total population (2015 - 2016)	1.29 (1.20-1.39)	1.32 (1.20-1.42)	2.29 (2.12-2.52)	4.04 (3.43-4.48)	5.27 (4.83-6.00)	3058
Age 3-5 years (2015 - 2016)	2.19 (1.97-2.44)	2.39 (2.02-2.66)	4.07 (3.62-4.59)	6.91 (5.88-9.67)	10.3 (7.15-11.6)	485
Age 6-11 years (2011 - 2012)	1.99 (1.80-2.19)	2.18 (1.70-2.61)	3.72 (3.35-4.03)	5.82 (4.95-6.45)	6.78 (5.98-8.18)	398
Age 6-11 years (2013 - 2014)	1.69 (1.39-2.05)	1.61 (1.24-2.20)	3.10 (2.29-3.80)	5.24 (3.54-7.57)	6.62 (5.03-9.83)	402
Age 6-11 years (2015 - 2016)	1.85 (1.63-2.10)	1.85 (1.65-2.12)	3.27 (2.79-4.25)	5.68 (4.51-6.72)	7.37 (5.68-8.88)	379
Age 12-19 years (2011 - 2012)	1.45 (1.24-1.70)	1.42 (1.24-1.78)	2.81 (1.96-3.19)	4.90 (3.82-5.69)	6.29 (4.90-6.57)	390
Age 12-19 years (2013 - 2014)	1.29 (1.18-1.42)	1.36 (1.20-1.59)	2.33 (2.12-2.64)	3.69 (3.24-4.20)	4.80 (4.09-5.05)	451
Age 12-19 years (2015 - 2016)	1.35 (1.16-1.57)	1.42 (1.11-1.70)	2.60 (2.18-2.93)	3.83 (3.21-5.27)	5.44 (4.03-7.88)	402
Age 20+ years (2011 - 2012)	1.29 (1.17-1.41)	1.31 (1.20-1.43)	2.21 (1.95-2.63)	3.83 (3.50-4.31)	5.54 (4.38-6.84)	1714
Age 20+ years (2013 - 2014)	1.22 (1.16-1.29)	1.18 (1.10-1.28)	2.23 (2.04-2.43)	4.00 (3.69-4.31)	5.59 (5.00-6.11)	1810
Age 20+ years (2015 - 2016)	1.21 (1.12-1.30)	1.24 (1.14-1.36)	2.12 (1.95-2.32)	3.57 (2.98-4.28)	4.83 (4.28-5.35)	1792
Males (2011 - 2012)	1.20 (1.10-1.32)	1.17 (1.08-1.33)	2.09 (1.85-2.53)	3.72 (3.37-4.22)	5.35 (4.11-6.34)	1261
Males (2013 - 2014)	1.20 (1.13-1.28)	1.16 (1.09-1.30)	2.26 (1.97-2.48)	3.80 (3.39-4.28)	4.79 (4.42-5.24)	1317
Males (2015 - 2016)	1.23 (1.11-1.35)	1.28 (1.16-1.38)	2.18 (2.02-2.41)	3.75 (3.09-4.42)	5.27 (4.55-6.15)	1524
Females (2011 - 2012)	1.51 (1.36-1.68)	1.51 (1.39-1.67)	2.73 (2.39-3.12)	4.83 (3.88-5.63)	6.52 (5.32-8.33)	1241
Females (2013 - 2014)	1.32 (1.23-1.43)	1.33 (1.17-1.52)	2.42 (2.18-2.72)	4.24 (3.96-4.60)	6.23 (5.29-8.04)	1346
Females (2015 - 2016)	1.35 (1.26-1.45)	1.39 (1.24-1.55)	2.43 (2.24-2.67)	4.28 (3.51-4.80)	5.25 (4.93-6.15)	1534
Mexican Americans (2011 - 2012)	1.22 (1.09-1.36)	1.16 (1.02-1.31)	2.20 (1.82-2.71)	4.00 (3.08-4.84)	5.74 (3.94-7.90)	317
Mexican Americans (2013 - 2014)	1.07 (.985-1.16)	1.02 (.943-1.13)	1.88 (1.68-2.19)	3.53 (2.78-4.32)	4.76 (4.28-5.62)	453
Mexican Americans (2015 - 2016)	1.07 (.962-1.19)	1.07 (.955-1.15)	2.03 (1.76-2.33)	3.31 (2.91-3.72)	4.42 (3.73-5.34)	584
Non-Hispanic blacks (2011 - 2012)	.775 (.698-.861)	.744 (.664-.918)	1.48 (1.32-1.64)	2.64 (2.24-3.06)	3.56 (3.21-3.86)	669
Non-Hispanic blacks (2013 - 2014)	.721 (.660-.786)	.717 (.657-.790)	1.31 (1.18-1.49)	2.42 (1.95-2.85)	3.26 (2.85-4.46)	581
Non-Hispanic blacks (2015 - 2016)	.779 (.690-.880)	.793 (.675-.896)	1.48 (1.30-1.79)	2.49 (2.27-2.93)	3.55 (2.90-4.83)	669
Non-Hispanic whites (2011 - 2012)	1.54 (1.38-1.70)	1.53 (1.44-1.64)	2.71 (2.18-3.18)	4.71 (3.82-5.54)	6.45 (5.36-7.63)	818
Non-Hispanic whites (2013 - 2014)	1.45 (1.38-1.52)	1.46 (1.27-1.63)	2.59 (2.45-2.87)	4.31 (3.99-4.59)	6.06 (5.03-6.79)	984
Non-Hispanic whites (2015 - 2016)	1.48 (1.37-1.59)	1.46 (1.36-1.62)	2.43 (2.20-2.79)	4.29 (3.55-4.83)	5.63 (4.91-6.51)	924
All Hispanics (2011 - 2012)	1.21 (1.09-1.34)	1.19 (1.09-1.28)	2.20 (1.81-2.70)	3.70 (3.10-4.66)	5.17 (3.73-6.49)	573
All Hispanics (2013 - 2014)	1.04 (.960-1.12)	1.01 (.935-1.10)	1.86 (1.68-2.00)	3.15 (2.78-3.64)	4.52 (3.76-5.32)	701
All Hispanics (2015 - 2016)	1.08 (.975-1.19)	1.09 (.964-1.20)	2.11 (1.91-2.33)	3.48 (3.14-3.85)	4.70 (4.19-5.35)	981
Asians (2011 - 2012)	1.55 (1.40-1.71)	1.49 (1.35-1.73)	2.86 (2.34-3.33)	5.03 (4.00-5.95)	7.26 (5.03-9.71)	353
Asians (2013 - 2014)	1.51 (1.34-1.69)	1.56 (1.19-1.82)	2.79 (2.37-3.21)	4.42 (3.96-5.51)	6.27 (4.99-8.05)	292
Asians (2015 - 2016)	1.37 (1.24-1.52)	1.41 (1.25-1.55)	2.61 (2.02-3.18)	4.52 (3.57-5.50)	5.78 (4.67-6.17)	332

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Barium_BiomonitoringSummary.html

Urinary Beryllium (1999 – 2010)‡

CAS Number 7440-41-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	2465
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2690
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2558
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2627
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2848
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	340
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	368
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	290
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	355
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	394
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	378
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	719
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	.140 (<LOD-.170)	762
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	725
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	701
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	376
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	451
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1406
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1560
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1543
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1520
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1857
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2019
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1227
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	.130 (<LOD-.150)	1335
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1281
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1271
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1327
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1398
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1238
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1355
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1277
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1305
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1300
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.13, 0.13, 0.13, 0.072, 0.072, and 0.072 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Beryllium_BiomonitoringSummary.html

Urinary Beryllium (1999 – 2010)‡

CAS Number 7440-41-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	884
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	.130 (<LOD-.160)	683
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	618
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	652
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	515
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	613
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	667
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	723
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	692
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	589
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	544
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1132
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1074
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1041
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1095
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.13, 0.13, 0.13, 0.072, 0.072, and 0.072 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Beryllium_BiomonitoringSummary.html

Urinary Beryllium (creatinine corrected) (1999 – 2010)‡

CAS Number 7440-41-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	2465
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2689
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2558
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2576
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2627
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2848
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	340
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	368
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	290
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	355
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	394
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	378
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	719
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	.231 (<LOD-.273)	762
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	725
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	701
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	376
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	451
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1406
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1559
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1543
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1520
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1857
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2019
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1227
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	.281 (<LOD-.333)	1334
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1281
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1271
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1327
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1398
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1238
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1355
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1277
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1305
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1300
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1450

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Beryllium_BiomonitoringSummary.html

Urinary Beryllium (creatinine corrected) (1999 – 2010)‡

CAS Number 7440-41-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	884
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	.346 (<LOD-.391)	682
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	618
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	652
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	515
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	613
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	667
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	723
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	692
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	589
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	544
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1132
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1074
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1041
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1095
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1225

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Beryllium_BiomonitoringSummary.html

Blood Cadmium (1999 – 2010)

CAS Number 81271-94-5

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.412 (.378-.449)	.400 (.300-.400)	.600 (.500-.700)	1.00 (1.00-1.10)	1.40 (1.30-1.40)	7970
Total population (2001 - 2002)	*	.300 (.300-.400)	.500 (.500-.600)	1.00 (.900-1.10)	1.40 (1.20-1.70)	8945
Total population (2003 - 2004)	.304 (.289-.320)	.300 (.300-.300)	.500 (.500-.600)	1.10 (1.00-1.20)	1.60 (1.50-1.60)	8372
Total population (2005 - 2006)	.310 (.294-.327)	.270 (.250-.280)	.510 (.460-.560)	1.02 (.910-1.13)	1.53 (1.34-1.75)	8407
Total population (2007 - 2008)	.315 (.300-.331)	.270 (.260-.280)	.500 (.460-.560)	1.00 (.900-1.13)	1.52 (1.30-1.77)	8266
Total population (2009 - 2010)	.302 (.293-.311)	.260 (.250-.270)	.480 (.460-.510)	.960 (.880-1.01)	1.40 (1.29-1.53)	8793
Age 1-5 years (1999 - 2000)	*	< LOD	.300 (<LOD-.400)	.400 (.300-.400)	.400 (.300-.700)	723
Age 1-5 years (2001 - 2002)	*	< LOD	< LOD	< LOD	.300 (.300-.300)	898
Age 1-5 years (2003 - 2004)	*	< LOD	< LOD	.200 (.200-.300)	.200 (.200-.400)	910
Age 1-5 years (2005 - 2006)	*	< LOD	< LOD	< LOD	.230 (.210-.250)	968
Age 1-5 years (2007 - 2008)	*	< LOD	< LOD	.210 (<LOD-.230)	.240 (.220-.260)	817
Age 1-5 years (2009 - 2010)	*	< LOD	< LOD	.200 (<LOD-.210)	.220 (.200-.240)	836
Age 6-11 years (1999 - 2000)	*	< LOD	.300 (<LOD-.400)	.400 (.300-.500)	.500 (.400-.500)	905
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	.300 (.300-.300)	.400 (.400-.400)	1044
Age 6-11 years (2003 - 2004)	*	< LOD	.200 (<LOD-.200)	.300 (.200-.300)	.300 (.300-.300)	856
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	.220 (.200-.240)	.260 (.230-.280)	934
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.230 (.210-.240)	.260 (.240-.280)	1011
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.210 (.200-.240)	.240 (.220-.280)	1009
Age 12-19 years (1999 - 2000)	.333 (.304-.366)	.300 (.300-.400)	.400 (.400-.500)	.800 (.600-1.00)	1.10 (.900-1.20)	2135
Age 12-19 years (2001 - 2002)	*	< LOD	.300 (.300-.400)	.500 (.400-.700)	.900 (.700-1.20)	2231
Age 12-19 years (2003 - 2004)	*	.200 (<LOD-.200)	.300 (.300-.300)	.600 (.500-.700)	.900 (.800-1.10)	2081
Age 12-19 years (2005 - 2006)	*	< LOD	.250 (.240-.270)	.520 (.410-.680)	.960 (.820-1.08)	1996
Age 12-19 years (2007 - 2008)	*	< LOD	.260 (.240-.270)	.520 (.400-.670)	.900 (.730-1.19)	1074
Age 12-19 years (2009 - 2010)	*	< LOD	.240 (.220-.260)	.340 (.310-.450)	.620 (.460-.850)	1183
Age 20+ years (1999 - 2000)	.468 (.426-.513)	.400 (.400-.500)	.700 (.600-.800)	1.10 (1.00-1.20)	1.50 (1.40-1.60)	4207
Age 20+ years (2001 - 2002)	.425 (.400-.452)	.400 (.400-.400)	.600 (.600-.700)	1.10 (1.00-1.30)	1.60 (1.40-1.90)	4772
Age 20+ years (2003 - 2004)	.378 (.359-.398)	.400 (.300-.400)	.600 (.600-.700)	1.20 (1.20-1.30)	1.80 (1.60-1.90)	4525
Age 20+ years (2005 - 2006)	.373 (.352-.395)	.330 (.310-.350)	.610 (.570-.660)	1.17 (1.06-1.26)	1.72 (1.53-1.95)	4509
Age 20+ years (2007 - 2008)	.376 (.354-.399)	.330 (.310-.350)	.600 (.550-.670)	1.16 (1.02-1.30)	1.70 (1.50-1.96)	5364
Age 20+ years (2009 - 2010)	.358 (.347-.370)	.320 (.310-.330)	.580 (.550-.600)	1.10 (1.00-1.18)	1.55 (1.43-1.72)	5765

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.3, 0.3, 0.14, 0.2, 0.2, and 0.2 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Blood Cadmium (1999 – 2010)

CAS Number 81271-94-5

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Males (1999 - 2000)	.403 (.368-.441)	.400 (.300-.400)	.600 (.500-.700)	1.00 (.900-1.10)	1.40 (1.30-1.50)	3913
Males (2001 - 2002)	*	.300 (<LOD-.300)	.500 (.500-.600)	1.00 (.900-1.10)	1.50 (1.20-1.80)	4339
Males (2003 - 2004)	.283 (.266-.300)	.300 (.200-.300)	.500 (.500-.500)	1.10 (1.00-1.20)	1.60 (1.50-1.60)	4131
Males (2005 - 2006)	*	.240 (.220-.260)	.470 (.420-.530)	1.02 (.910-1.12)	1.53 (1.27-1.86)	4092
Males (2007 - 2008)	.299 (.283-.317)	.250 (.230-.260)	.470 (.420-.540)	1.05 (.930-1.19)	1.60 (1.30-1.90)	4147
Males (2009 - 2010)	.279 (.268-.289)	.230 (.220-.240)	.410 (.390-.460)	.920 (.830-1.00)	1.45 (1.30-1.58)	4366
Females (1999 - 2000)	.421 (.386-.460)	.400 (.400-.400)	.600 (.500-.700)	1.00 (1.00-1.10)	1.30 (1.20-1.40)	4057
Females (2001 - 2002)	.382 (.362-.403)	.400 (.300-.400)	.600 (.500-.600)	1.00 (.900-1.10)	1.40 (1.20-1.70)	4606
Females (2003 - 2004)	.326 (.309-.344)	.300 (.300-.300)	.600 (.500-.600)	1.10 (1.00-1.20)	1.60 (1.50-1.70)	4241
Females (2005 - 2006)	.329 (.311-.349)	.290 (.280-.310)	.530 (.480-.580)	1.02 (.870-1.18)	1.54 (1.33-1.79)	4315
Females (2007 - 2008)	.331 (.316-.348)	.290 (.280-.310)	.530 (.480-.570)	.980 (.860-1.10)	1.43 (1.29-1.63)	4119
Females (2009 - 2010)	.326 (.314-.339)	.290 (.280-.310)	.520 (.490-.550)	.960 (.880-1.10)	1.40 (1.20-1.53)	4427
Mexican Americans (1999 - 2000)	.395 (.367-.424)	.400 (.400-.400)	.500 (.500-.600)	.800 (.700-1.00)	1.20 (.900-1.30)	2742
Mexican Americans (2001 - 2002)	*	< LOD	.400 (.400-.500)	.600 (.500-.800)	1.00 (.700-1.30)	2268
Mexican Americans (2003 - 2004)	.235 (.216-.255)	.200 (.200-.300)	.400 (.300-.400)	.600 (.500-.800)	1.00 (.800-1.50)	2085
Mexican Americans (2005 - 2006)	*	.220 (.200-.240)	.350 (.300-.400)	.580 (.510-.680)	.820 (.710-1.00)	2236
Mexican Americans (2007 - 2008)	*	.220 (.210-.230)	.350 (.320-.370)	.570 (.510-.660)	.840 (.690-1.02)	1712
Mexican Americans (2009 - 2010)	*	.220 (.200-.230)	.330 (.300-.370)	.580 (.500-.670)	.800 (.690-.960)	1966
Non-Hispanic blacks (1999 - 2000)	.393 (.361-.427)	.400 (.300-.400)	.600 (.500-.600)	1.00 (.900-1.20)	1.40 (1.20-1.60)	1842
Non-Hispanic blacks (2001 - 2002)	*	.300 (<LOD-.300)	.500 (.500-.600)	1.00 (.900-1.10)	1.40 (1.20-1.70)	2219
Non-Hispanic blacks (2003 - 2004)	.304 (.275-.337)	.300 (.300-.300)	.500 (.400-.600)	1.00 (.900-1.20)	1.50 (1.30-1.70)	2292
Non-Hispanic blacks (2005 - 2006)	.307 (.290-.326)	.260 (.250-.280)	.490 (.440-.570)	1.03 (.880-1.21)	1.50 (1.23-1.79)	2193
Non-Hispanic blacks (2007 - 2008)	.333 (.316-.352)	.280 (.270-.300)	.550 (.480-.620)	1.20 (1.01-1.36)	1.81 (1.45-2.13)	1746
Non-Hispanic blacks (2009 - 2010)	.328 (.310-.347)	.280 (.260-.290)	.550 (.490-.640)	1.10 (1.00-1.20)	1.52 (1.38-1.73)	1593
Non-Hispanic whites (1999 - 2000)	.420 (.376-.470)	.400 (.300-.500)	.600 (.500-.700)	1.10 (1.00-1.20)	1.40 (1.30-1.50)	2716
Non-Hispanic whites (2001 - 2002)	*	.300 (.300-.400)	.600 (.500-.600)	1.00 (.900-1.20)	1.50 (1.30-1.80)	3806
Non-Hispanic whites (2003 - 2004)	.313 (.296-.331)	.300 (.300-.300)	.600 (.500-.600)	1.10 (1.00-1.20)	1.60 (1.50-1.70)	3478
Non-Hispanic whites (2005 - 2006)	.321 (.300-.343)	.270 (.250-.300)	.540 (.470-.610)	1.08 (.930-1.23)	1.64 (1.40-1.94)	3310
Non-Hispanic whites (2007 - 2008)	.321 (.303-.341)	.270 (.260-.290)	.520 (.470-.580)	1.05 (.920-1.20)	1.55 (1.30-1.80)	3461
Non-Hispanic whites (2009 - 2010)	.307 (.297-.318)	.270 (.260-.280)	.490 (.460-.540)	.990 (.900-1.10)	1.50 (1.36-1.60)	3760

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.3, 0.3, 0.14, 0.2, 0.2, and 0.2 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Blood Cadmium (2011 – 2016)

CAS Number 81271-94-5

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.279 (.267-.292)	.250 (.230-.260)	.460 (.430-.490)	.960 (.870-1.10)	1.50 (1.30-1.70)	7920
Total population (2013 - 2014)	.235 (.224-.247)	.210 (.200-.220)	.410 (.370-.450)	.840 (.730-.940)	1.22 (1.03-1.40)	5215
Total population (2015 - 2016)	.238 (.224-.253)	.220 (.200-.230)	.400 (.370-.430)	.810 (.700-.920)	1.22 (1.07-1.37)	4988
Age 1-5 years (2011 - 2012)	*	< LOD	< LOD	.190 (.160-.200)	.210 (.190-.240)	713
Age 1-5 years (2013 - 2014)	*	< LOD	.100 (<LOD-.100)	.130 (.120-.140)	.150 (.140-.170)	818
Age 1-5 years (2015 - 2016)	*	< LOD	.100 (<LOD-.120)	.140 (.130-.150)	.160 (.140-.180)	790
Age 6-11 years (2011 - 2012)	*	< LOD	.160 (<LOD-.180)	.210 (.190-.230)	.240 (.220-.280)	1048
Age 6-11 years (2013 - 2014)	*	< LOD	.120 (.110-.130)	.150 (.140-.170)	.190 (.170-.200)	1075
Age 6-11 years (2015 - 2016)	*	.100 (<LOD-.100)	.140 (.120-.150)	.180 (.160-.190)	.200 (.180-.230)	1023
Age 12-19 years (2011 - 2012)	*	.160 (<LOD-.170)	.230 (.210-.240)	.340 (.290-.470)	.650 (.470-.880)	1129
Age 12-19 years (2013 - 2014)	.134 (.123-.146)	.120 (.110-.130)	.180 (.160-.190)	.280 (.220-.460)	.490 (.300-.960)	627
Age 12-19 years (2015 - 2016)	.133 (.123-.144)	.130 (.120-.140)	.180 (.160-.210)	.260 (.230-.280)	.330 (.270-.490)	565
Age 20+ years (2011 - 2012)	.337 (.323-.353)	.300 (.290-.320)	.550 (.520-.580)	1.14 (1.01-1.28)	1.70 (1.50-1.80)	5030
Age 20+ years (2013 - 2014)	.297 (.280-.315)	.270 (.260-.290)	.510 (.450-.570)	.940 (.830-1.08)	1.36 (1.17-1.64)	2695
Age 20+ years (2015 - 2016)	.295 (.277-.314)	.270 (.250-.290)	.480 (.440-.520)	.940 (.830-1.09)	1.35 (1.22-1.48)	2610
Males (2011 - 2012)	.255 (.238-.274)	.210 (.200-.230)	.410 (.360-.480)	.940 (.820-1.09)	1.48 (1.20-1.70)	3968
Males (2013 - 2014)	.206 (.192-.221)	.180 (.170-.190)	.330 (.300-.370)	.750 (.610-.940)	1.18 (.940-1.42)	2587
Males (2015 - 2016)	.215 (.201-.230)	.180 (.170-.200)	.350 (.310-.400)	.820 (.650-.940)	1.17 (.990-1.37)	2488
Females (2011 - 2012)	.304 (.289-.320)	.280 (.260-.300)	.490 (.460-.510)	.980 (.850-1.16)	1.53 (1.30-1.70)	3952
Females (2013 - 2014)	.267 (.252-.283)	.250 (.240-.280)	.480 (.440-.530)	.890 (.790-.960)	1.29 (1.09-1.53)	2628
Females (2015 - 2016)	.263 (.244-.282)	.250 (.230-.270)	.440 (.410-.470)	.800 (.680-.940)	1.25 (1.10-1.40)	2500
Mexican Americans (2011 - 2012)	.217 (.202-.233)	.200 (.180-.220)	.310 (.290-.340)	.550 (.510-.600)	.810 (.710-.920)	1077
Mexican Americans (2013 - 2014)	.182 (.166-.199)	.180 (.150-.200)	.280 (.250-.310)	.490 (.400-.620)	.740 (.660-.800)	969
Mexican Americans (2015 - 2016)	.194 (.180-.209)	.180 (.170-.200)	.300 (.280-.320)	.540 (.440-.660)	.870 (.570-1.27)	994
Non-Hispanic blacks (2011 - 2012)	.291 (.274-.309)	.260 (.240-.270)	.470 (.430-.520)	1.07 (.950-1.20)	1.50 (1.40-1.60)	2195
Non-Hispanic blacks (2013 - 2014)	.252 (.225-.281)	.220 (.190-.260)	.480 (.390-.620)	1.03 (.930-1.17)	1.48 (1.24-1.67)	1119
Non-Hispanic blacks (2015 - 2016)	.278 (.253-.306)	.250 (.230-.280)	.490 (.440-.550)	.930 (.830-1.05)	1.38 (1.14-1.95)	1070
Non-Hispanic whites (2011 - 2012)	.284 (.264-.305)	.250 (.230-.270)	.470 (.420-.520)	1.02 (.810-1.25)	1.65 (1.30-1.90)	2493
Non-Hispanic whites (2013 - 2014)	.242 (.227-.257)	.220 (.200-.230)	.430 (.380-.480)	.860 (.700-1.02)	1.30 (1.03-1.65)	1848
Non-Hispanic whites (2015 - 2016)	.239 (.219-.261)	.220 (.190-.240)	.410 (.370-.440)	.830 (.660-1.00)	1.25 (1.00-1.43)	1511
All Hispanics (2011 - 2012)	.227 (.211-.244)	.210 (.190-.230)	.330 (.310-.380)	.600 (.540-.660)	.900 (.760-1.00)	1931
All Hispanics (2013 - 2014)	.186 (.170-.204)	.180 (.160-.190)	.290 (.250-.330)	.560 (.450-.680)	.800 (.740-.870)	1481
All Hispanics (2015 - 2016)	.193 (.180-.207)	.180 (.170-.200)	.300 (.280-.320)	.520 (.450-.610)	.840 (.620-1.16)	1664
Asians (2011 - 2012)	.394 (.355-.437)	.390 (.340-.450)	.680 (.610-.760)	1.04 (.960-1.18)	1.40 (1.20-1.48)	1005
Asians (2013 - 2014)	.339 (.302-.380)	.330 (.300-.390)	.590 (.540-.660)	.900 (.740-1.11)	1.31 (.940-1.46)	510
Asians (2015 - 2016)	.359 (.329-.392)	.340 (.310-.410)	.570 (.510-.630)	.930 (.760-1.11)	1.33 (1.10-1.57)	479

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.16, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Urinary Cadmium (1999 – 2010)

CAS Number 81271-94-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000**)	.193 (.169-.220)	.232 (.214-.249)	.475 (.436-.519)	.858 (.763-.980)	1.20 (1.06-1.34)	2257
Total population (2001 - 2002**)	.210 (.189-.235)	.230 (.207-.255)	.458 (.423-.482)	.839 (.753-.919)	1.20 (1.07-1.28)	2690
Total population (2003 - 2004)	.211 (.196-.226)	.210 (.200-.230)	.450 (.400-.500)	.800 (.730-.880)	1.15 (.980-1.26)	2543
Total population (2005 - 2006)	.191 (.170-.216)	.200 (.170-.220)	.400 (.360-.460)	.780 (.700-.860)	1.05 (.960-1.17)	2576
Total population (2007 - 2008)	.185 (.172-.198)	.180 (.170-.200)	.380 (.360-.400)	.700 (.650-.770)	1.00 (.920-1.12)	2627
Total population (2009 - 2010)	.179 (.169-.190)	.180 (.170-.200)	.370 (.340-.400)	.690 (.630-.770)	1.03 (.910-1.13)	2848
Age 6-11 years (1999 - 2000**)	*	.078 (.061-.101)	.141 (.115-.173)	.219 (.178-.233)	.279 (.211-.507)	310
Age 6-11 years (2001 - 2002**)	.061 (<LOD-.081)	.077 (.067-.092)	.140 (.112-.160)	.219 (.184-.262)	.282 (.260-.326)	368
Age 6-11 years (2003 - 2004)	.077 (.065-.090)	.080 (.060-.090)	.120 (.100-.160)	.180 (.160-.310)	.310 (.170-.610)	287
Age 6-11 years (2005 - 2006)	.066 (.056-.078)	.060 (.050-.080)	.110 (.090-.130)	.180 (.130-.240)	.240 (.160-.290)	355
Age 6-11 years (2007 - 2008)	.064 (.058-.071)	.060 (.050-.070)	.110 (.090-.130)	.180 (.140-.210)	.230 (.180-.310)	394
Age 6-11 years (2009 - 2010)	.057 (.053-.061)	.060 (.050-.060)	.090 (.080-.100)	.130 (.120-.160)	.170 (.140-.230)	378
Age 12-19 years (1999 - 2000**)	.092 (.067-.126)	.128 (.107-.148)	.203 (.183-.232)	.329 (.272-.372)	.426 (.366-.596)	648
Age 12-19 years (2001 - 2002**)	.109 (.087-.136)	.135 (.114-.157)	.210 (.189-.247)	.327 (.289-.366)	.452 (.366-.480)	762
Age 12-19 years (2003 - 2004)	.121 (.109-.134)	.130 (.110-.150)	.200 (.170-.210)	.300 (.260-.360)	.390 (.330-.490)	724
Age 12-19 years (2005 - 2006)	.099 (.090-.109)	.110 (.100-.120)	.170 (.150-.190)	.240 (.210-.280)	.310 (.250-.430)	701
Age 12-19 years (2007 - 2008)	.089 (.080-.100)	.080 (.070-.110)	.160 (.140-.170)	.260 (.200-.300)	.330 (.280-.410)	376
Age 12-19 years (2009 - 2010)	.081 (.076-.086)	.080 (.070-.080)	.140 (.120-.150)	.220 (.180-.250)	.280 (.240-.300)	451
Age 20+ years (1999 - 2000**)	.281 (.253-.313)	.306 (.261-.339)	.551 (.510-.623)	.980 (.836-1.13)	1.32 (1.13-1.57)	1299
Age 20+ years (2001 - 2002**)	.273 (.249-.299)	.280 (.261-.308)	.545 (.493-.607)	.972 (.855-1.06)	1.28 (1.20-1.43)	1560
Age 20+ years (2003 - 2004)	.260 (.238-.284)	.270 (.240-.300)	.530 (.470-.580)	.890 (.800-.990)	1.25 (1.09-1.46)	1532
Age 20+ years (2005 - 2006)	.241 (.213-.272)	.250 (.220-.290)	.490 (.440-.560)	.860 (.790-.930)	1.21 (1.06-1.32)	1520
Age 20+ years (2007 - 2008)	.232 (.215-.251)	.240 (.210-.260)	.450 (.410-.490)	.790 (.730-.870)	1.13 (.990-1.44)	1857
Age 20+ years (2009 - 2010)	.229 (.213-.245)	.230 (.210-.260)	.430 (.400-.470)	.790 (.700-.910)	1.13 (1.03-1.28)	2019
Males (1999 - 2000**)	.199 (.165-.241)	.227 (.193-.263)	.462 (.381-.539)	.892 (.748-1.15)	1.41 (.980-1.83)	1121
Males (2001 - 2002**)	.201 (.177-.229)	.223 (.191-.257)	.445 (.393-.481)	.875 (.741-1.03)	1.22 (1.12-1.38)	1335
Males (2003 - 2004)	.206 (.190-.222)	.210 (.190-.230)	.440 (.390-.490)	.790 (.700-.870)	1.01 (.890-1.25)	1277
Males (2005 - 2006)	.195 (.176-.217)	.210 (.190-.230)	.400 (.360-.440)	.800 (.730-.890)	1.17 (1.01-1.30)	1271
Males (2007 - 2008)	.179 (.162-.197)	.180 (.160-.200)	.360 (.320-.400)	.670 (.540-.780)	.950 (.800-1.16)	1327
Males (2009 - 2010)	.170 (.157-.185)	.180 (.150-.200)	.350 (.310-.380)	.650 (.560-.700)	.950 (.770-1.14)	1398
Females (1999 - 2000**)	.187 (.153-.229)	.239 (.220-.255)	.492 (.456-.540)	.818 (.705-.980)	1.10 (1.01-1.19)	1136
Females (2001 - 2002**)	.219 (.192-.251)	.234 (.202-.265)	.466 (.433-.519)	.817 (.733-.886)	1.17 (.918-1.36)	1355
Females (2003 - 2004)	.216 (.195-.238)	.210 (.200-.240)	.450 (.400-.530)	.820 (.700-.960)	1.20 (1.02-1.37)	1266
Females (2005 - 2006)	.188 (.160-.221)	.190 (.160-.220)	.400 (.350-.480)	.750 (.640-.860)	.980 (.830-1.20)	1305
Females (2007 - 2008)	.191 (.177-.207)	.190 (.170-.200)	.400 (.370-.430)	.740 (.660-.840)	1.09 (.940-1.38)	1300
Females (2009 - 2010)	.188 (.172-.206)	.200 (.170-.210)	.400 (.360-.440)	.740 (.620-.880)	1.07 (.910-1.31)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.06, 0.06, 0.06, 0.042, 0.042, and 0.042 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**All results are corrected for molybdenum oxide interference in the ICP-MS method.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Urinary Cadmium (1999 – 2010)

CAS Number 81271-94-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000**)	.191 (.157-.233)	.202 (.167-.221)	.447 (.351-.551)	.813 (.686-.977)	1.12 (.886-1.38)	780
Mexican Americans (2001 - 2002**)	.160 (.135-.189)	.181 (.171-.198)	.322 (.285-.362)	.559 (.430-.733)	.766 (.633-1.15)	683
Mexican Americans (2003 - 2004)	.175 (.151-.203)	.170 (.150-.210)	.350 (.290-.430)	.680 (.520-.820)	1.04 (.820-1.20)	614
Mexican Americans (2005 - 2006)	.173 (.152-.196)	.180 (.160-.200)	.340 (.300-.380)	.560 (.500-.630)	.780 (.660-.900)	652
Mexican Americans (2007 - 2008)	.159 (.139-.181)	.170 (.140-.200)	.320 (.290-.370)	.570 (.510-.620)	.710 (.630-.830)	515
Mexican Americans (2009 - 2010)	.153 (.136-.173)	.150 (.130-.170)	.300 (.240-.360)	.530 (.440-.680)	.790 (.610-.840)	613
Non-Hispanic blacks (1999 - 2000**)	.283 (.208-.387)	.316 (.243-.412)	.633 (.498-.806)	1.22 (.892-1.38)	1.48 (1.30-1.72)	546
Non-Hispanic blacks (2001 - 2002**)	.277 (.229-.336)	.302 (.257-.354)	.589 (.476-.713)	1.04 (.843-1.38)	1.51 (1.28-1.74)	667
Non-Hispanic blacks (2003 - 2004)	.265 (.237-.295)	.270 (.220-.320)	.550 (.440-.640)	.960 (.810-1.17)	1.52 (1.06-1.82)	717
Non-Hispanic blacks (2005 - 2006)	.236 (.218-.254)	.240 (.210-.260)	.480 (.420-.530)	.830 (.670-.930)	1.04 (.870-1.26)	692
Non-Hispanic blacks (2007 - 2008)	.246 (.218-.277)	.260 (.220-.300)	.460 (.420-.530)	.840 (.690-.980)	1.40 (.900-1.85)	589
Non-Hispanic blacks (2009 - 2010)	.234 (.211-.260)	.240 (.220-.270)	.450 (.410-.540)	.910 (.750-1.06)	1.42 (.990-1.74)	544
Non-Hispanic whites (1999 - 2000**)	.175 (.148-.206)	.220 (.194-.246)	.455 (.388-.510)	.848 (.714-1.01)	1.17 (.963-1.47)	760
Non-Hispanic whites (2001 - 2002**)	.204 (.179-.231)	.221 (.191-.255)	.445 (.394-.479)	.817 (.717-.875)	1.17 (.989-1.24)	1132
Non-Hispanic whites (2003 - 2004)	.209 (.192-.226)	.200 (.190-.220)	.440 (.390-.500)	.790 (.700-.860)	1.13 (.940-1.26)	1070
Non-Hispanic whites (2005 - 2006)	.185 (.159-.216)	.200 (.160-.230)	.400 (.330-.480)	.780 (.670-.920)	1.05 (.940-1.25)	1041
Non-Hispanic whites (2007 - 2008)	.177 (.161-.195)	.170 (.150-.190)	.370 (.320-.400)	.690 (.620-.780)	1.00 (.880-1.13)	1095
Non-Hispanic whites (2009 - 2010)	.171 (.158-.186)	.180 (.150-.200)	.350 (.320-.390)	.680 (.590-.780)	1.05 (.880-1.18)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.06, 0.06, 0.06, 0.042, 0.042, and 0.042 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result

**All results are corrected for molybdenum oxide interference in the ICP-MS method.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Urinary Cadmium (2011 – 2016)

CAS Number 81271-94-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.155 (.143-.169)	.153 (.134-.175)	.310 (.281-.352)	.629 (.590-.670)	.874 (.806-1.08)	2504
Total population (2013 - 2014)	.124 (.116-.133)	.126 (.116-.137)	.273 (.243-.302)	.576 (.519-.621)	.842 (.767-.945)	2664
Total population (2015 - 2016)	.129 (.117-.141)	.131 (.119-.139)	.289 (.263-.330)	.616 (.516-.713)	.909 (.727-1.10)	3061
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	.057 (.048-.066)	.078 (.066-.088)	486
Age 6-11 years (2011 - 2012)	*	< LOD	.070 (.056-.076)	.107 (.088-.128)	.148 (.118-.200)	399
Age 6-11 years (2013 - 2014)	*	< LOD	.050 (.044-.059)	.087 (.077-.101)	.113 (.098-.140)	402
Age 6-11 years (2015 - 2016)	*	< LOD	.058 (.049-.073)	.103 (.083-.122)	.134 (.101-.203)	379
Age 12-19 years (2011 - 2012)	*	.069 (<LOD-.080)	.118 (.100-.152)	.218 (.191-.267)	.280 (.219-.339)	390
Age 12-19 years (2013 - 2014)	.064 (.055-.075)	.063 (.044-.078)	.116 (.092-.146)	.206 (.146-.292)	.292 (.184-.379)	451
Age 12-19 years (2015 - 2016)	.055 (.048-.064)	.049 (.043-.057)	.097 (.073-.111)	.171 (.136-.204)	.248 (.192-.278)	402
Age 20+ years (2011 - 2012)	.194 (.178-.211)	.192 (.175-.217)	.375 (.336-.417)	.715 (.664-.790)	1.08 (.846-1.27)	1715
Age 20+ years (2013 - 2014)	.156 (.146-.167)	.158 (.147-.170)	.314 (.279-.359)	.654 (.603-.726)	.971 (.842-1.08)	1811
Age 20+ years (2015 - 2016)	.174 (.157-.193)	.179 (.159-.203)	.359 (.311-.419)	.706 (.616-.806)	1.08 (.839-1.20)	1794
Males (2011 - 2012)	.150 (.136-.166)	.152 (.131-.170)	.292 (.262-.331)	.589 (.518-.675)	.832 (.769-.941)	1262
Males (2013 - 2014)	.118 (.110-.126)	.123 (.107-.135)	.238 (.214-.278)	.492 (.394-.617)	.777 (.578-1.09)	1318
Males (2015 - 2016)	.122 (.113-.132)	.125 (.116-.135)	.272 (.243-.296)	.532 (.442-.634)	.765 (.678-.924)	1524
Females (2011 - 2012)	.160 (.142-.181)	.153 (.123-.192)	.332 (.292-.375)	.669 (.607-.741)	1.07 (.798-1.31)	1242
Females (2013 - 2014)	.131 (.118-.145)	.132 (.112-.154)	.297 (.271-.331)	.622 (.553-.719)	.896 (.773-1.05)	1346
Females (2015 - 2016)	.135 (.120-.153)	.137 (.117-.155)	.312 (.277-.368)	.683 (.554-.806)	1.07 (.743-1.27)	1537
Mexican Americans (2011 - 2012)	.121 (.112-.132)	.115 (.094-.139)	.221 (.183-.274)	.456 (.386-.547)	.643 (.539-.705)	317
Mexican Americans (2013 - 2014)	.101 (.092-.111)	.096 (.079-.109)	.219 (.168-.264)	.424 (.331-.522)	.615 (.439-.785)	453
Mexican Americans (2015 - 2016)	.107 (.097-.116)	.098 (.081-.124)	.238 (.197-.275)	.475 (.409-.533)	.721 (.548-.770)	585
Non-Hispanic blacks (2011 - 2012)	.193 (.172-.216)	.199 (.174-.216)	.366 (.304-.445)	.719 (.594-.831)	1.05 (.825-1.38)	669
Non-Hispanic blacks (2013 - 2014)	.179 (.146-.219)	.182 (.136-.239)	.387 (.305-.519)	.772 (.625-.947)	1.14 (.885-1.37)	581
Non-Hispanic blacks (2015 - 2016)	.178 (.157-.201)	.166 (.149-.204)	.403 (.329-.491)	.803 (.679-.986)	1.11 (.878-1.48)	671
Non-Hispanic whites (2011 - 2012)	.152 (.135-.170)	.148 (.123-.183)	.303 (.269-.352)	.615 (.524-.684)	.846 (.759-1.09)	820
Non-Hispanic whites (2013 - 2014)	.121 (.110-.134)	.124 (.106-.140)	.267 (.232-.302)	.552 (.486-.621)	.842 (.692-.987)	985
Non-Hispanic whites (2015 - 2016)	.124 (.112-.139)	.129 (.109-.142)	.284 (.254-.344)	.611 (.464-.765)	.909 (.683-1.14)	924
All Hispanics (2011 - 2012)	.133 (.118-.150)	.127 (.105-.153)	.267 (.207-.325)	.546 (.452-.609)	.782 (.646-.976)	573
All Hispanics (2013 - 2014)	.101 (.092-.111)	.096 (.079-.110)	.212 (.174-.259)	.424 (.340-.501)	.617 (.470-.801)	701
All Hispanics (2015 - 2016)	.108 (.096-.122)	.101 (.087-.120)	.235 (.201-.274)	.475 (.408-.592)	.727 (.592-.918)	982
Asians (2011 - 2012)	.218 (.190-.249)	.215 (.172-.251)	.453 (.405-.604)	.865 (.762-1.23)	1.34 (1.02-1.75)	353
Asians (2013 - 2014)	.171 (.146-.201)	.172 (.147-.206)	.417 (.304-.566)	.803 (.664-1.14)	1.19 (.817-1.27)	292
Asians (2015 - 2016)	.180 (.160-.204)	.193 (.170-.232)	.363 (.326-.429)	.650 (.541-.762)	.934 (.686-1.06)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.056, 0.036, and 0.036, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Urinary Cadmium (creatinine corrected) (1999 – 2010)

CAS Number 81271-94-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000**)	.181 (.157-.209)	.219 (.199-.238)	.423 (.391-.446)	.712 (.645-.757)	.941 (.826-1.07)	2257
Total population (2001 - 2002**)	.199 (.181-.218)	.212 (.194-.232)	.404 (.377-.440)	.690 (.630-.754)	.919 (.813-.998)	2689
Total population (2003 - 2004)	.210 (.201-.219)	.208 (.189-.226)	.412 (.381-.438)	.678 (.650-.716)	.940 (.833-1.04)	2543
Total population (2005 - 2006)	.189 (.169-.210)	.180 (.160-.200)	.370 (.310-.430)	.650 (.590-.720)	.910 (.770-1.08)	2576
Total population (2007 - 2008)	.193 (.177-.210)	.190 (.180-.210)	.370 (.330-.410)	.660 (.580-.740)	.960 (.840-1.06)	2627
Total population (2009 - 2010)	.191 (.184-.199)	.180 (.170-.190)	.370 (.340-.400)	.680 (.630-.730)	.910 (.840-1.00)	2848
Age 6-11 years (1999 - 2000**)	*	.085 (.063-.107)	.148 (.123-.182)	.210 (.171-.316)	.316 (.184-.607)	310
Age 6-11 years (2001 - 2002**)	.075 (<LOD-.094)	.100 (.083-.112)	.166 (.136-.192)	.233 (.206-.281)	.318 (.221-.440)	368
Age 6-11 years (2003 - 2004)	.090 (.078-.104)	.091 (.075-.104)	.126 (.111-.156)	.200 (.147-.350)	.308 (.178-.415)	287
Age 6-11 years (2005 - 2006)	.081 (.072-.092)	.080 (.070-.090)	.130 (.110-.140)	.170 (.150-.190)	.200 (.180-.240)	355
Age 6-11 years (2007 - 2008)	.084 (.076-.092)	.080 (.080-.090)	.120 (.110-.140)	.170 (.150-.240)	.260 (.180-.430)	394
Age 6-11 years (2009 - 2010)	.077 (.070-.085)	.080 (.070-.090)	.110 (.100-.130)	.160 (.130-.220)	.230 (.140-.280)	378
Age 12-19 years (1999 - 2000**)	.071 (.051-.098)	.093 (.084-.106)	.147 (.130-.163)	.215 (.204-.240)	.283 (.222-.404)	648
Age 12-19 years (2001 - 2002**)	.078 (.067-.091)	.091 (.085-.101)	.137 (.123-.143)	.191 (.175-.234)	.280 (.234-.321)	762
Age 12-19 years (2003 - 2004)	.086 (.077-.096)	.084 (.074-.097)	.122 (.113-.135)	.176 (.154-.198)	.234 (.187-.274)	724
Age 12-19 years (2005 - 2006)	.076 (.071-.081)	.080 (.070-.090)	.120 (.110-.130)	.150 (.140-.180)	.210 (.160-.240)	701
Age 12-19 years (2007 - 2008)	.070 (.062-.079)	.070 (.070-.080)	.110 (.100-.110)	.150 (.140-.160)	.180 (.160-.210)	376
Age 12-19 years (2009 - 2010)	.076 (.068-.084)	.080 (.070-.090)	.120 (.100-.130)	.160 (.140-.180)	.190 (.170-.270)	451
Age 20+ years (1999 - 2000**)	.267 (.247-.289)	.288 (.261-.304)	.484 (.433-.545)	.769 (.727-.818)	1.07 (.927-1.17)	1299
Age 20+ years (2001 - 2002**)	.261 (.236-.289)	.273 (.247-.303)	.481 (.426-.518)	.779 (.691-.850)	.979 (.874-1.12)	1559
Age 20+ years (2003 - 2004)	.268 (.255-.281)	.270 (.247-.292)	.490 (.444-.538)	.767 (.688-.830)	1.02 (.909-1.14)	1532
Age 20+ years (2005 - 2006)	.240 (.216-.267)	.230 (.200-.260)	.440 (.400-.500)	.730 (.660-.820)	1.02 (.850-1.18)	1520
Age 20+ years (2007 - 2008)	.247 (.227-.270)	.240 (.220-.270)	.430 (.390-.470)	.740 (.670-.840)	1.05 (.930-1.16)	1857
Age 20+ years (2009 - 2010)	.242 (.232-.253)	.230 (.220-.250)	.440 (.420-.460)	.760 (.700-.820)	1.01 (.910-1.14)	2019
Males (1999 - 2000**)	.154 (.131-.182)	.176 (.158-.191)	.329 (.293-.382)	.617 (.537-.700)	.789 (.696-.929)	1121
Males (2001 - 2002**)	.159 (.143-.177)	.168 (.157-.182)	.335 (.304-.364)	.536 (.491-.653)	.757 (.690-.856)	1334
Males (2003 - 2004)	.173 (.161-.187)	.162 (.143-.185)	.325 (.300-.352)	.591 (.560-.631)	.740 (.678-.795)	1277
Males (2005 - 2006)	.160 (.145-.177)	.150 (.130-.160)	.300 (.260-.340)	.620 (.560-.670)	.820 (.710-.990)	1271
Males (2007 - 2008)	.160 (.146-.175)	.160 (.140-.180)	.290 (.260-.330)	.520 (.440-.650)	.740 (.600-.960)	1327
Males (2009 - 2010)	.155 (.149-.161)	.140 (.140-.160)	.280 (.250-.300)	.540 (.510-.600)	.800 (.670-.900)	1398
Females (1999 - 2000**)	.211 (.170-.261)	.267 (.239-.308)	.473 (.423-.551)	.783 (.690-.917)	1.09 (.813-1.38)	1136
Females (2001 - 2002**)	.245 (.216-.278)	.263 (.228-.297)	.479 (.414-.541)	.792 (.687-.884)	.985 (.876-1.16)	1355
Females (2003 - 2004)	.252 (.238-.266)	.253 (.227-.288)	.487 (.438-.533)	.802 (.716-.906)	1.06 (.940-1.21)	1266
Females (2005 - 2006)	.220 (.193-.252)	.220 (.180-.250)	.420 (.370-.470)	.690 (.590-.850)	.990 (.780-1.31)	1305
Females (2007 - 2008)	.231 (.210-.254)	.230 (.200-.270)	.440 (.390-.480)	.770 (.700-.860)	1.08 (.970-1.16)	1300
Females (2009 - 2010)	.233 (.218-.248)	.240 (.220-.260)	.450 (.420-.490)	.770 (.680-.860)	1.09 (.910-1.19)	1450

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**All results are corrected for molybdenum oxide interference in the ICP-MS method.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Urinary Cadmium (creatinine corrected) (1999 – 2010)

CAS Number 81271-94-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000**)	.175 (.137-.223)	.181 (.144-.225)	.331 (.266-.418)	.622 (.441-.828)	.856 (.674-1.13)	780
Mexican Americans (2001 - 2002**)	.156 (.136-.178)	.170 (.150-.184)	.282 (.263-.340)	.501 (.388-.614)	.693 (.507-.839)	682
Mexican Americans (2003 - 2004)	.163 (.147-.181)	.159 (.140-.183)	.296 (.256-.311)	.531 (.418-.667)	.718 (.562-.950)	614
Mexican Americans (2005 - 2006)	.162 (.146-.181)	.150 (.140-.170)	.280 (.220-.340)	.480 (.430-.510)	.570 (.520-.640)	652
Mexican Americans (2007 - 2008)	.159 (.141-.178)	.160 (.130-.180)	.270 (.220-.330)	.480 (.370-.620)	.720 (.520-.950)	515
Mexican Americans (2009 - 2010)	.161 (.149-.173)	.150 (.130-.170)	.280 (.240-.320)	.510 (.410-.630)	.720 (.540-.890)	613
Non-Hispanic blacks (1999 - 2000**)	.183 (.140-.240)	.202 (.168-.241)	.414 (.343-.472)	.663 (.516-.827)	.873 (.722-.962)	546
Non-Hispanic blacks (2001 - 2002**)	.190 (.156-.232)	.196 (.174-.225)	.387 (.336-.449)	.686 (.559-.850)	.917 (.725-1.08)	667
Non-Hispanic blacks (2003 - 2004)	.190 (.173-.210)	.185 (.168-.207)	.338 (.288-.431)	.700 (.500-.818)	.865 (.708-1.10)	717
Non-Hispanic blacks (2005 - 2006)	.171 (.159-.183)	.160 (.140-.180)	.320 (.290-.370)	.550 (.500-.580)	.700 (.610-.730)	692
Non-Hispanic blacks (2007 - 2008)	.180 (.164-.197)	.170 (.160-.190)	.330 (.290-.390)	.600 (.470-.700)	.770 (.690-.900)	589
Non-Hispanic blacks (2009 - 2010)	.186 (.170-.203)	.180 (.160-.200)	.360 (.310-.430)	.680 (.570-.760)	.860 (.740-1.04)	544
Non-Hispanic whites (1999 - 2000**)	.175 (.146-.209)	.219 (.191-.250)	.432 (.387-.470)	.729 (.666-.783)	1.00 (.826-1.16)	760
Non-Hispanic whites (2001 - 2002**)	.205 (.184-.229)	.224 (.208-.242)	.421 (.382-.470)	.719 (.668-.784)	.931 (.806-1.05)	1132
Non-Hispanic whites (2003 - 2004)	.220 (.207-.235)	.221 (.197-.253)	.434 (.398-.476)	.687 (.647-.767)	1.00 (.830-1.08)	1070
Non-Hispanic whites (2005 - 2006)	.193 (.169-.221)	.180 (.160-.220)	.390 (.310-.480)	.680 (.630-.750)	.930 (.800-1.07)	1041
Non-Hispanic whites (2007 - 2008)	.199 (.178-.222)	.200 (.180-.230)	.380 (.340-.440)	.700 (.630-.810)	1.03 (.880-1.13)	1095
Non-Hispanic whites (2009 - 2010)	.192 (.183-.201)	.180 (.170-.200)	.390 (.340-.420)	.700 (.630-.760)	.910 (.840-1.02)	1225

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**All results are corrected for molybdenum oxide interference in the ICP-MS method.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Urinary Cadmium (creatinine corrected) (2011 – 2016)

CAS Number 81271-94-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.176 (.165-.187)	.172 (.159-.182)	.346 (.313-.378)	.582 (.551-.639)	.907 (.772-.997)	2502
Total population (2013 - 2014)	.144 (.136-.152)	.138 (.125-.151)	.288 (.263-.311)	.563 (.487-.621)	.800 (.712-.859)	2663
Total population (2015 - 2016)	.144 (.135-.154)	.139 (.128-.152)	.293 (.264-.320)	.523 (.459-.589)	.781 (.675-.906)	3058
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	.167 (.139-.192)	.227 (.179-.278)	485
Age 6-11 years (2011 - 2012)	*	< LOD	.118 (.107-.129)	.168 (.150-.211)	.235 (.180-.300)	398
Age 6-11 years (2013 - 2014)	*	< LOD	.086 (.076-.096)	.147 (.119-.167)	.175 (.140-.214)	402
Age 6-11 years (2015 - 2016)	*	< LOD	.086 (.073-.104)	.130 (.111-.139)	.157 (.132-.189)	379
Age 12-19 years (2011 - 2012)	*	.071 (<LOD-.078)	.118 (.103-.135)	.176 (.153-.204)	.250 (.176-.444)	390
Age 12-19 years (2013 - 2014)	.058 (.053-.064)	.055 (.045-.068)	.092 (.080-.107)	.133 (.117-.176)	.178 (.133-.233)	451
Age 12-19 years (2015 - 2016)	.052 (.047-.058)	.050 (.044-.057)	.074 (.063-.082)	.117 (.098-.134)	.147 (.121-.187)	402
Age 20+ years (2011 - 2012)	.220 (.204-.237)	.213 (.198-.230)	.416 (.374-.443)	.678 (.594-.772)	.977 (.892-1.15)	1714
Age 20+ years (2013 - 2014)	.182 (.173-.191)	.181 (.163-.195)	.335 (.306-.368)	.626 (.586-.674)	.868 (.750-1.00)	1810
Age 20+ years (2015 - 2016)	.190 (.175-.205)	.188 (.166-.208)	.346 (.318-.385)	.623 (.538-.709)	.882 (.765-.963)	1792
Males (2011 - 2012)	.140 (.127-.156)	.136 (.120-.148)	.244 (.213-.309)	.492 (.424-.554)	.713 (.583-.801)	1261
Males (2013 - 2014)	.118 (.108-.128)	.107 (.098-.121)	.218 (.195-.253)	.402 (.349-.471)	.613 (.519-.675)	1317
Males (2015 - 2016)	.116 (.109-.123)	.111 (.104-.118)	.211 (.187-.239)	.378 (.344-.431)	.561 (.494-.671)	1524
Females (2011 - 2012)	.218 (.202-.236)	.222 (.200-.243)	.430 (.382-.456)	.707 (.594-.868)	1.08 (.904-1.22)	1241
Females (2013 - 2014)	.174 (.162-.186)	.173 (.151-.204)	.355 (.311-.382)	.663 (.621-.726)	.964 (.844-1.09)	1346
Females (2015 - 2016)	.178 (.162-.196)	.185 (.165-.206)	.369 (.315-.408)	.667 (.533-.806)	.915 (.754-1.08)	1534
Mexican Americans (2011 - 2012)	.137 (.127-.147)	.124 (.105-.144)	.244 (.196-.315)	.409 (.367-.506)	.519 (.406-1.00)	317
Mexican Americans (2013 - 2014)	.115 (.102-.129)	.114 (.096-.128)	.216 (.186-.260)	.388 (.297-.502)	.546 (.463-.729)	453
Mexican Americans (2015 - 2016)	.116 (.108-.126)	.115 (.094-.131)	.208 (.193-.244)	.385 (.333-.417)	.547 (.461-.676)	584
Non-Hispanic blacks (2011 - 2012)	.150 (.135-.166)	.139 (.126-.164)	.286 (.259-.307)	.476 (.416-.659)	.761 (.636-.857)	669
Non-Hispanic blacks (2013 - 2014)	.136 (.114-.162)	.132 (.100-.170)	.281 (.218-.382)	.583 (.419-.663)	.691 (.616-.833)	581
Non-Hispanic blacks (2015 - 2016)	.141 (.126-.159)	.133 (.109-.163)	.278 (.234-.320)	.543 (.400-.698)	.765 (.600-.897)	669
Non-Hispanic whites (2011 - 2012)	.183 (.167-.202)	.180 (.158-.200)	.370 (.327-.416)	.582 (.543-.677)	.932 (.725-1.15)	818
Non-Hispanic whites (2013 - 2014)	.150 (.137-.163)	.141 (.126-.165)	.290 (.256-.322)	.571 (.453-.650)	.807 (.673-.957)	984
Non-Hispanic whites (2015 - 2016)	.147 (.135-.159)	.144 (.127-.163)	.300 (.264-.337)	.541 (.457-.634)	.821 (.644-.961)	924
All Hispanics (2011 - 2012)	.149 (.143-.156)	.144 (.132-.163)	.281 (.244-.320)	.471 (.400-.519)	.686 (.516-.942)	573
All Hispanics (2013 - 2014)	.113 (.100-.127)	.112 (.091-.127)	.216 (.186-.263)	.407 (.327-.498)	.569 (.494-.683)	701
All Hispanics (2015 - 2016)	.122 (.110-.135)	.117 (.098-.132)	.238 (.195-.287)	.412 (.347-.528)	.639 (.503-.775)	981
Asians (2011 - 2012)	.291 (.262-.323)	.286 (.223-.342)	.610 (.532-.732)	1.03 (.913-1.12)	1.36 (1.07-1.59)	353
Asians (2013 - 2014)	.268 (.230-.313)	.264 (.219-.309)	.609 (.483-.676)	.934 (.838-1.09)	1.23 (.910-1.74)	292
Asians (2015 - 2016)	.247 (.212-.287)	.250 (.208-.285)	.458 (.396-.577)	.860 (.702-1.05)	1.17 (.833-1.79)	332

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cadmium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Cadmium_FactSheet.html

Urinary Cesium (1999 – 2010)

CAS Number 7440-46-2

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	4.35 (4.00-4.74)	4.90 (4.40-5.40)	7.10 (6.60-7.70)	9.60 (8.80-10.3)	11.5 (10.2-13.0)	2464
Total population (2001 - 2002)	4.81 (4.40-5.26)	5.49 (5.12-5.90)	7.91 (7.47-8.39)	10.4 (9.56-11.4)	12.6 (11.1-13.8)	2690
Total population (2003 - 2004)	4.67 (4.39-4.97)	5.14 (4.84-5.49)	7.68 (7.20-8.21)	10.6 (9.55-11.4)	12.7 (11.5-13.9)	2558
Total population (2005 - 2006)	4.69 (4.41-4.98)	5.19 (4.91-5.43)	7.68 (7.21-8.09)	10.1 (9.65-10.9)	12.6 (12.0-13.4)	2576
Total population (2007 - 2008)	4.42 (4.25-4.60)	4.90 (4.64-5.12)	7.02 (6.79-7.38)	9.46 (9.04-9.86)	11.3 (10.5-11.8)	2627
Total population (2009 - 2010)	4.06 (3.87-4.26)	4.47 (4.22-4.66)	6.54 (6.35-6.75)	8.98 (8.25-9.68)	11.0 (10.1-11.6)	2848
Age 6-11 years (1999 - 2000)	4.87 (4.08-5.81)	5.70 (4.60-6.70)	7.30 (6.70-8.00)	9.00 (7.90-10.1)	9.70 (9.00-10.8)	340
Age 6-11 years (2001 - 2002)	4.87 (4.08-5.82)	5.64 (4.69-6.56)	7.96 (6.77-8.84)	9.88 (8.64-10.6)	11.1 (10.2-12.4)	368
Age 6-11 years (2003 - 2004)	5.21 (4.74-5.71)	5.50 (4.76-6.37)	8.08 (7.10-8.83)	11.5 (8.86-12.9)	12.9 (10.8-13.6)	290
Age 6-11 years (2005 - 2006)	4.74 (4.31-5.21)	5.38 (4.67-5.60)	7.00 (6.38-7.50)	9.30 (8.60-9.95)	11.2 (9.62-12.9)	355
Age 6-11 years (2007 - 2008)	4.58 (4.22-4.96)	5.10 (4.50-5.44)	6.91 (6.45-7.47)	8.25 (7.77-8.93)	9.88 (8.47-10.9)	394
Age 6-11 years (2009 - 2010)	4.21 (3.84-4.62)	4.58 (4.01-5.12)	6.68 (6.25-6.98)	8.28 (7.47-9.11)	9.56 (8.68-11.9)	378
Age 12-19 years (1999 - 2000)	4.55 (4.09-5.05)	5.20 (4.40-5.60)	6.90 (6.10-7.80)	8.80 (8.10-9.50)	10.7 (8.90-12.5)	718
Age 12-19 years (2001 - 2002)	5.22 (4.57-5.95)	5.62 (5.16-6.12)	7.55 (7.13-8.04)	9.77 (9.12-11.1)	12.0 (10.0-15.0)	762
Age 12-19 years (2003 - 2004)	5.04 (4.59-5.54)	5.70 (5.16-6.07)	7.53 (6.91-8.37)	9.71 (8.80-10.4)	11.6 (9.92-13.2)	725
Age 12-19 years (2005 - 2006)	4.76 (4.24-5.34)	5.27 (4.80-5.74)	7.50 (6.71-8.04)	9.60 (8.52-10.5)	10.6 (9.68-11.8)	701
Age 12-19 years (2007 - 2008)	4.58 (4.10-5.13)	5.14 (4.30-5.76)	6.93 (6.33-7.37)	9.20 (7.67-9.91)	10.6 (8.91-15.1)	376
Age 12-19 years (2009 - 2010)	3.70 (3.39-4.02)	4.11 (3.54-4.70)	6.17 (5.72-6.47)	8.20 (7.16-8.79)	9.52 (8.66-10.6)	451
Age 20+ years (1999 - 2000)	4.26 (3.94-4.62)	4.80 (4.40-5.30)	7.10 (6.50-7.60)	9.80 (8.90-10.7)	11.7 (10.2-13.4)	1406
Age 20+ years (2001 - 2002)	4.74 (4.32-5.20)	5.43 (5.05-5.87)	7.97 (7.43-8.52)	10.6 (9.73-11.5)	12.9 (11.2-14.2)	1560
Age 20+ years (2003 - 2004)	4.56 (4.23-4.90)	5.03 (4.60-5.42)	7.66 (7.01-8.34)	10.7 (9.40-11.5)	12.9 (11.5-14.9)	1543
Age 20+ years (2005 - 2006)	4.67 (4.38-4.99)	5.14 (4.84-5.44)	7.77 (7.32-8.30)	10.4 (9.72-11.5)	13.2 (12.4-13.9)	1520
Age 20+ years (2007 - 2008)	4.38 (4.20-4.58)	4.79 (4.59-4.99)	7.12 (6.81-7.52)	9.69 (9.23-10.2)	11.4 (10.6-12.0)	1857
Age 20+ years (2009 - 2010)	4.10 (3.88-4.34)	4.49 (4.21-4.71)	6.57 (6.33-6.84)	9.26 (8.37-10.1)	11.1 (10.3-11.9)	2019
Males (1999 - 2000)	4.84 (4.35-5.38)	5.50 (4.60-6.00)	7.50 (7.00-8.20)	9.70 (8.80-11.3)	11.7 (10.3-13.0)	1226
Males (2001 - 2002)	5.34 (4.89-5.84)	6.13 (5.61-6.64)	8.27 (7.84-9.08)	10.8 (10.1-12.1)	12.8 (11.3-15.0)	1335
Males (2003 - 2004)	5.03 (4.73-5.36)	5.59 (5.17-6.00)	7.98 (7.31-8.63)	11.0 (9.53-11.8)	12.9 (11.5-16.1)	1281
Males (2005 - 2006)	5.13 (4.78-5.51)	5.37 (5.03-5.71)	7.92 (7.61-8.41)	10.9 (9.96-11.6)	13.2 (12.4-13.9)	1271
Males (2007 - 2008)	4.77 (4.59-4.96)	5.26 (4.98-5.43)	7.18 (6.93-7.54)	9.68 (8.93-10.6)	11.6 (10.6-12.6)	1327
Males (2009 - 2010)	4.27 (4.00-4.55)	4.70 (4.46-5.00)	6.57 (6.39-6.81)	8.67 (7.91-9.57)	10.7 (9.66-11.3)	1398
Females (1999 - 2000)	3.95 (3.63-4.29)	4.50 (4.20-4.90)	6.70 (6.20-7.30)	9.10 (8.30-10.0)	11.2 (9.90-12.9)	1238
Females (2001 - 2002)	4.36 (3.95-4.81)	4.87 (4.45-5.25)	7.33 (6.71-8.01)	9.77 (9.07-11.0)	12.4 (10.4-13.8)	1355
Females (2003 - 2004)	4.35 (4.03-4.70)	4.79 (4.25-5.26)	7.30 (6.87-7.81)	10.2 (9.40-11.0)	12.1 (11.2-13.6)	1277
Females (2005 - 2006)	4.30 (3.98-4.65)	4.89 (4.58-5.25)	7.43 (6.99-7.83)	9.79 (9.30-10.5)	12.1 (10.6-13.1)	1305
Females (2007 - 2008)	4.12 (3.88-4.37)	4.40 (4.17-4.74)	6.84 (6.32-7.36)	9.31 (8.69-9.76)	10.5 (9.93-11.7)	1300
Females (2009 - 2010)	3.88 (3.63-4.14)	4.13 (3.83-4.55)	6.46 (5.95-6.90)	9.29 (8.62-10.0)	11.2 (10.3-12.1)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.14, 0.14, 0.2, 0.066, 0.066, and 0.066 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cesium_BiomonitoringSummary.html

Urinary Cesium (1999 – 2010)

CAS Number 7440-46-2

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	4.32 (3.82-4.89)	4.80 (4.30-5.20)	6.70 (6.40-7.20)	9.10 (8.00-9.90)	11.1 (9.60-12.7)	884
Mexican Americans (2001 - 2002)	4.63 (4.10-5.24)	5.29 (4.59-5.89)	7.08 (6.42-7.99)	9.13 (7.86-11.3)	11.3 (8.81-14.9)	683
Mexican Americans (2003 - 2004)	4.94 (4.64-5.27)	5.62 (5.01-6.09)	7.86 (7.15-8.46)	10.3 (8.99-11.3)	11.9 (10.7-14.7)	618
Mexican Americans (2005 - 2006)	4.64 (4.41-4.88)	5.18 (4.91-5.55)	7.29 (6.74-7.73)	9.52 (8.76-9.98)	11.5 (9.88-11.9)	652
Mexican Americans (2007 - 2008)	4.50 (4.06-4.99)	4.93 (4.40-5.56)	6.98 (6.38-7.49)	9.12 (8.25-9.82)	10.8 (9.45-12.1)	515
Mexican Americans (2009 - 2010)	4.20 (3.95-4.48)	4.47 (4.16-4.87)	6.49 (6.00-7.01)	8.64 (7.81-9.40)	10.2 (9.15-11.4)	613
Non-Hispanic blacks (1999 - 2000)	4.94 (4.33-5.64)	5.40 (4.80-6.40)	7.50 (6.90-8.40)	9.80 (8.80-10.8)	11.6 (9.80-13.1)	568
Non-Hispanic blacks (2001 - 2002)	4.93 (4.70-5.17)	5.33 (5.05-5.64)	7.36 (6.97-7.59)	9.44 (8.71-9.68)	10.7 (10.1-12.3)	667
Non-Hispanic blacks (2003 - 2004)	4.71 (4.47-4.97)	5.12 (4.71-5.49)	7.17 (6.72-7.60)	9.13 (8.52-9.99)	10.7 (9.99-11.4)	723
Non-Hispanic blacks (2005 - 2006)	4.78 (4.42-5.18)	5.26 (5.03-5.44)	7.20 (6.63-7.66)	9.14 (8.26-10.6)	11.0 (9.63-13.7)	692
Non-Hispanic blacks (2007 - 2008)	4.64 (4.29-5.01)	4.90 (4.48-5.31)	6.90 (6.35-7.42)	9.39 (8.29-10.3)	11.3 (9.59-12.6)	589
Non-Hispanic blacks (2009 - 2010)	4.07 (3.82-4.35)	4.68 (4.29-4.84)	6.56 (6.19-7.01)	8.98 (8.12-9.31)	9.97 (9.27-11.3)	544
Non-Hispanic whites (1999 - 2000)	4.25 (3.83-4.72)	4.80 (4.20-5.50)	7.20 (6.60-7.90)	9.70 (8.90-10.7)	11.8 (10.3-13.3)	821
Non-Hispanic whites (2001 - 2002)	4.77 (4.27-5.32)	5.49 (4.99-6.05)	7.98 (7.45-8.61)	10.4 (9.54-11.4)	12.6 (11.0-13.8)	1132
Non-Hispanic whites (2003 - 2004)	4.56 (4.22-4.94)	5.02 (4.59-5.42)	7.60 (7.00-8.23)	10.7 (9.26-11.8)	12.9 (11.5-14.7)	1074
Non-Hispanic whites (2005 - 2006)	4.64 (4.25-5.05)	5.19 (4.76-5.49)	7.77 (7.18-8.46)	10.3 (9.62-11.5)	13.1 (12.1-13.9)	1041
Non-Hispanic whites (2007 - 2008)	4.29 (4.07-4.53)	4.76 (4.48-5.08)	7.02 (6.67-7.49)	9.50 (8.91-9.93)	11.3 (10.3-12.2)	1095
Non-Hispanic whites (2009 - 2010)	3.96 (3.73-4.20)	4.38 (4.10-4.64)	6.43 (6.15-6.63)	8.62 (7.86-9.29)	10.5 (9.35-11.5)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.14, 0.14, 0.2, 0.066, 0.066, and 0.066 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cesium_BiomonitoringSummary.html

Urinary Cesium (2011 – 2016)

CAS Number 7440-46-2

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	3.82 (3.58-4.08)	4.11 (3.90-4.42)	6.31 (5.96-6.63)	8.81 (8.39-9.21)	10.5 (9.76-11.1)	2503
Total population (2013 - 2014)	3.94 (3.76-4.12)	4.21 (3.96-4.47)	6.63 (6.36-6.85)	9.31 (8.87-9.80)	11.3 (10.4-11.8)	2664
Total population (2015 - 2016)	3.92 (3.65-4.21)	4.19 (3.83-4.56)	6.29 (5.86-6.79)	8.93 (8.17-9.61)	11.0 (9.76-12.6)	3061
Age 3-5 years (2015 - 2016)	3.62 (3.23-4.05)	3.81 (3.22-4.44)	6.21 (5.57-7.02)	8.52 (7.50-9.10)	9.30 (8.90-12.5)	486
Age 6-11 years (2011 - 2012)	3.91 (3.50-4.36)	4.52 (3.75-4.96)	6.71 (6.18-7.16)	8.61 (7.39-9.28)	10.2 (9.02-10.6)	399
Age 6-11 years (2013 - 2014)	4.15 (3.80-4.52)	4.63 (4.05-5.12)	7.11 (6.58-7.54)	9.58 (8.49-10.0)	10.4 (9.92-11.1)	402
Age 6-11 years (2015 - 2016)	3.96 (3.62-4.34)	4.31 (3.78-4.90)	6.36 (5.56-7.33)	8.73 (7.81-9.37)	9.89 (8.48-11.6)	379
Age 12-19 years (2011 - 2012)	3.56 (3.08-4.13)	3.96 (3.45-4.56)	5.96 (5.19-6.73)	7.74 (7.17-8.99)	9.55 (7.81-10.6)	390
Age 12-19 years (2013 - 2014)	4.14 (3.72-4.61)	4.55 (4.12-5.08)	6.62 (6.09-7.29)	8.93 (8.19-9.86)	10.9 (9.40-11.8)	451
Age 12-19 years (2015 - 2016)	3.76 (3.40-4.16)	4.07 (3.67-4.53)	6.11 (5.45-6.72)	8.22 (6.91-9.99)	10.4 (8.22-12.4)	402
Age 20+ years (2011 - 2012)	3.85 (3.61-4.10)	4.11 (3.85-4.43)	6.31 (5.94-6.67)	9.08 (8.51-9.44)	10.7 (9.81-11.2)	1714
Age 20+ years (2013 - 2014)	3.89 (3.70-4.09)	4.09 (3.85-4.36)	6.57 (6.32-6.82)	9.30 (8.67-9.90)	11.3 (10.4-12.2)	1811
Age 20+ years (2015 - 2016)	3.95 (3.66-4.26)	4.19 (3.80-4.63)	6.30 (5.88-6.81)	8.95 (8.48-9.70)	11.4 (10.2-12.8)	1794
Males (2011 - 2012)	4.20 (3.94-4.47)	4.49 (4.21-4.98)	6.53 (6.15-6.95)	9.08 (8.43-9.55)	10.6 (9.80-11.1)	1261
Males (2013 - 2014)	4.10 (3.84-4.38)	4.47 (4.10-4.88)	6.79 (6.42-7.22)	9.30 (8.56-10.1)	11.1 (9.81-13.1)	1318
Males (2015 - 2016)	4.21 (3.99-4.45)	4.66 (4.26-4.95)	6.59 (6.09-7.05)	8.94 (8.03-9.78)	10.7 (9.58-12.1)	1524
Females (2011 - 2012)	3.49 (3.16-3.85)	3.75 (3.48-3.99)	5.94 (5.38-6.55)	8.58 (7.58-9.33)	10.3 (9.44-11.2)	1242
Females (2013 - 2014)	3.78 (3.57-4.02)	3.98 (3.60-4.28)	6.35 (5.98-6.75)	9.31 (8.50-9.88)	11.5 (10.1-12.4)	1346
Females (2015 - 2016)	3.65 (3.33-4.01)	3.77 (3.32-4.30)	5.95 (5.30-6.59)	8.93 (8.07-9.68)	11.4 (9.69-12.8)	1537
Mexican Americans (2011 - 2012)	3.76 (3.43-4.12)	4.12 (3.61-4.54)	5.50 (5.21-6.21)	7.77 (7.32-8.75)	9.68 (8.07-10.4)	317
Mexican Americans (2013 - 2014)	3.99 (3.76-4.24)	4.25 (3.65-5.09)	6.53 (6.13-7.18)	9.01 (8.28-9.61)	10.2 (9.01-11.2)	453
Mexican Americans (2015 - 2016)	3.90 (3.66-4.16)	4.37 (4.01-4.69)	6.38 (5.98-6.69)	8.39 (7.82-9.31)	9.68 (9.27-10.6)	585
Non-Hispanic blacks (2011 - 2012)	3.97 (3.68-4.29)	4.49 (4.10-4.88)	6.49 (5.98-6.88)	8.12 (7.56-9.21)	9.59 (8.61-11.0)	669
Non-Hispanic blacks (2013 - 2014)	4.41 (3.97-4.89)	4.83 (4.20-5.38)	6.82 (6.20-7.30)	8.93 (8.01-9.81)	10.7 (9.34-12.2)	581
Non-Hispanic blacks (2015 - 2016)	4.15 (3.89-4.42)	4.58 (4.24-4.91)	6.88 (6.42-7.22)	9.12 (8.15-9.70)	10.3 (9.38-12.1)	671
Non-Hispanic whites (2011 - 2012)	3.78 (3.50-4.07)	4.01 (3.75-4.30)	6.30 (5.85-6.85)	9.08 (8.53-9.48)	10.6 (9.88-11.1)	820
Non-Hispanic whites (2013 - 2014)	3.81 (3.54-4.10)	4.09 (3.70-4.47)	6.62 (6.19-7.06)	9.38 (8.56-10.2)	11.5 (10.1-13.1)	985
Non-Hispanic whites (2015 - 2016)	3.83 (3.46-4.23)	3.96 (3.59-4.48)	5.96 (5.47-6.85)	8.85 (7.53-10.1)	11.4 (9.17-13.6)	924
All Hispanics (2011 - 2012)	3.80 (3.44-4.20)	4.13 (3.65-4.62)	5.87 (5.40-6.34)	7.77 (7.16-8.73)	9.52 (8.08-10.3)	573
All Hispanics (2013 - 2014)	4.04 (3.79-4.30)	4.21 (3.70-4.77)	6.65 (6.29-7.17)	9.01 (8.43-9.61)	10.4 (9.30-11.6)	701
All Hispanics (2015 - 2016)	3.87 (3.64-4.12)	4.38 (4.07-4.66)	6.38 (5.97-6.71)	8.47 (7.97-8.96)	9.68 (9.24-10.1)	982
Asians (2011 - 2012)	4.22 (3.88-4.60)	4.43 (4.00-5.02)	7.42 (6.58-7.92)	10.7 (9.27-11.4)	12.4 (11.1-15.6)	352
Asians (2013 - 2014)	3.92 (3.61-4.24)	4.10 (3.43-4.52)	6.41 (5.87-7.48)	9.81 (7.91-11.4)	11.4 (9.11-14.3)	292
Asians (2015 - 2016)	4.32 (4.10-4.56)	4.68 (4.24-5.15)	7.27 (6.69-8.09)	10.3 (9.18-11.1)	11.6 (10.4-13.6)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.12, 0.086, and 0.086, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cesium_BiomonitoringSummary.html

Urinary Cesium (creatinine corrected) (1999 – 2010)

CAS Number 7440-46-2

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	4.10 (3.96-4.25)	4.13 (3.97-4.27)	5.41 (5.21-5.70)	7.14 (6.83-7.50)	8.64 (8.00-9.30)	2464
Total population (2001 - 2002)	4.54 (4.30-4.79)	4.44 (4.20-4.64)	6.06 (5.66-6.47)	8.18 (7.62-8.95)	10.2 (8.84-11.7)	2689
Total population (2003 - 2004)	4.64 (4.42-4.87)	4.42 (4.21-4.74)	6.11 (5.76-6.48)	8.51 (7.99-9.15)	10.6 (9.75-11.0)	2558
Total population (2005 - 2006)	4.62 (4.37-4.88)	4.51 (4.20-4.76)	6.19 (5.90-6.55)	8.84 (8.14-9.24)	10.8 (9.71-12.1)	2576
Total population (2007 - 2008)	4.62 (4.42-4.82)	4.58 (4.36-4.79)	6.23 (5.96-6.61)	8.67 (7.79-9.52)	10.6 (9.78-11.2)	2627
Total population (2009 - 2010)	4.33 (4.17-4.49)	4.28 (4.12-4.45)	6.00 (5.70-6.23)	8.06 (7.76-8.36)	9.75 (9.05-10.4)	2848
Age 6-11 years (1999 - 2000)	5.34 (5.03-5.67)	5.42 (5.03-6.04)	6.63 (6.18-7.13)	8.23 (7.13-9.41)	9.90 (7.88-10.1)	340
Age 6-11 years (2001 - 2002)	5.95 (5.48-6.46)	5.91 (5.43-6.53)	7.77 (7.00-8.28)	9.27 (8.35-11.9)	11.9 (9.38-12.3)	368
Age 6-11 years (2003 - 2004)	6.07 (5.63-6.53)	6.02 (5.45-6.49)	8.30 (7.16-8.99)	10.8 (9.15-11.8)	11.9 (10.3-15.8)	290
Age 6-11 years (2005 - 2006)	5.85 (5.41-6.34)	5.74 (5.21-6.41)	7.65 (6.67-9.11)	10.1 (9.38-10.8)	11.6 (10.1-14.9)	355
Age 6-11 years (2007 - 2008)	5.96 (5.53-6.43)	6.12 (5.79-6.55)	7.88 (7.33-8.53)	10.7 (8.91-12.1)	12.5 (10.9-14.1)	394
Age 6-11 years (2009 - 2010)	5.74 (5.30-6.22)	5.58 (5.15-6.12)	7.16 (6.71-7.87)	9.19 (8.13-10.4)	12.2 (8.69-14.8)	378
Age 12-19 years (1999 - 2000)	3.43 (3.29-3.58)	3.54 (3.29-3.68)	4.35 (4.17-4.56)	5.31 (4.97-5.79)	6.67 (5.33-8.09)	718
Age 12-19 years (2001 - 2002)	3.73 (3.41-4.08)	3.55 (3.36-3.74)	4.74 (4.40-5.14)	6.10 (5.35-7.63)	8.08 (6.44-9.82)	762
Age 12-19 years (2003 - 2004)	3.60 (3.37-3.85)	3.51 (3.33-3.72)	4.53 (4.24-4.87)	6.08 (5.14-6.94)	7.27 (6.13-9.07)	725
Age 12-19 years (2005 - 2006)	3.66 (3.40-3.93)	3.59 (3.40-3.83)	4.76 (4.30-5.20)	5.93 (5.62-6.62)	7.62 (6.03-8.07)	701
Age 12-19 years (2007 - 2008)	3.58 (3.31-3.88)	3.70 (3.22-3.96)	4.98 (4.60-5.17)	6.36 (5.38-7.28)	7.93 (6.06-9.76)	376
Age 12-19 years (2009 - 2010)	3.46 (3.27-3.65)	3.48 (3.23-3.74)	4.39 (4.16-4.70)	5.54 (5.01-6.32)	6.56 (5.95-7.35)	451
Age 20+ years (1999 - 2000)	4.08 (3.88-4.29)	4.06 (3.85-4.29)	5.39 (5.04-5.85)	7.17 (6.84-7.58)	8.61 (7.91-9.30)	1406
Age 20+ years (2001 - 2002)	4.54 (4.30-4.78)	4.43 (4.20-4.59)	5.94 (5.64-6.40)	8.15 (7.46-8.97)	10.2 (8.74-11.7)	1559
Age 20+ years (2003 - 2004)	4.68 (4.46-4.91)	4.47 (4.27-4.80)	6.11 (5.83-6.43)	8.47 (7.76-9.17)	10.5 (9.68-11.2)	1543
Age 20+ years (2005 - 2006)	4.67 (4.42-4.93)	4.54 (4.25-4.78)	6.24 (5.93-6.66)	8.92 (8.29-9.31)	11.2 (9.71-12.7)	1520
Age 20+ years (2007 - 2008)	4.67 (4.46-4.88)	4.58 (4.34-4.82)	6.19 (5.93-6.61)	8.65 (7.79-9.52)	10.6 (9.68-11.3)	1857
Age 20+ years (2009 - 2010)	4.34 (4.17-4.53)	4.28 (4.10-4.49)	6.07 (5.70-6.33)	8.20 (7.81-8.65)	9.80 (9.05-11.1)	2019
Males (1999 - 2000)	3.78 (3.65-3.91)	3.78 (3.61-3.96)	4.96 (4.72-5.20)	6.50 (6.18-6.70)	7.71 (7.01-8.64)	1226
Males (2001 - 2002)	4.22 (3.96-4.51)	4.10 (3.87-4.41)	5.60 (5.27-6.03)	7.67 (6.90-8.48)	9.46 (8.22-11.5)	1334
Males (2003 - 2004)	4.24 (3.99-4.50)	4.12 (3.89-4.37)	5.66 (5.19-6.06)	7.66 (6.90-8.40)	9.00 (8.36-10.3)	1281
Males (2005 - 2006)	4.21 (3.94-4.50)	4.11 (3.72-4.46)	5.75 (5.14-6.11)	7.68 (6.91-8.78)	9.33 (8.84-9.84)	1271
Males (2007 - 2008)	4.27 (4.04-4.51)	4.19 (4.02-4.42)	5.81 (5.46-6.29)	7.84 (7.20-8.65)	9.61 (8.65-10.2)	1327
Males (2009 - 2010)	3.89 (3.70-4.09)	3.85 (3.60-4.06)	5.29 (4.89-5.69)	7.02 (6.76-7.42)	8.38 (7.87-9.18)	1398
Females (1999 - 2000)	4.43 (4.20-4.68)	4.45 (4.14-4.77)	5.92 (5.36-6.47)	7.70 (7.16-8.07)	9.41 (8.00-10.4)	1238
Females (2001 - 2002)	4.86 (4.58-5.16)	4.72 (4.50-5.06)	6.54 (5.93-7.00)	8.50 (7.84-9.79)	10.3 (8.95-12.2)	1355
Females (2003 - 2004)	5.05 (4.77-5.35)	4.77 (4.44-5.14)	6.58 (6.14-7.22)	9.43 (8.56-10.5)	11.3 (10.7-12.3)	1277
Females (2005 - 2006)	5.05 (4.78-5.33)	4.86 (4.57-5.17)	6.72 (6.31-7.23)	9.65 (9.23-10.3)	12.6 (11.0-13.3)	1305
Females (2007 - 2008)	4.98 (4.76-5.20)	4.90 (4.69-5.20)	6.72 (6.20-7.06)	9.50 (8.37-10.5)	11.3 (10.7-12.1)	1300
Females (2009 - 2010)	4.79 (4.63-4.97)	4.69 (4.50-4.93)	6.57 (6.34-6.85)	8.88 (8.36-9.33)	10.5 (9.56-12.0)	1450

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cesium_BiomonitoringSummary.html

Urinary Cesium (creatinine corrected) (1999 – 2010)

CAS Number 7440-46-2

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	3.99 (3.73-4.25)	3.95 (3.65-4.17)	5.09 (4.79-5.39)	6.65 (6.08-7.10)	7.98 (7.20-8.95)	884
Mexican Americans (2001 - 2002)	4.51 (4.00-5.08)	4.51 (3.82-4.95)	5.91 (5.31-6.64)	7.77 (6.60-10.0)	10.0 (7.60-20.5)	682
Mexican Americans (2003 - 2004)	4.58 (4.16-5.05)	4.51 (4.10-4.92)	5.74 (5.42-6.09)	7.53 (6.59-8.91)	9.44 (8.24-10.6)	618
Mexican Americans (2005 - 2006)	4.36 (4.10-4.64)	4.40 (3.97-4.73)	5.69 (5.24-6.22)	7.23 (6.69-7.80)	8.14 (7.65-9.33)	652
Mexican Americans (2007 - 2008)	4.50 (4.22-4.79)	4.39 (3.96-4.86)	6.07 (5.57-6.59)	7.63 (7.30-7.89)	9.06 (7.89-10.5)	515
Mexican Americans (2009 - 2010)	4.41 (4.17-4.65)	4.38 (4.04-4.59)	5.70 (5.34-6.07)	7.68 (7.17-8.24)	8.89 (8.50-9.52)	613
Non-Hispanic blacks (1999 - 2000)	3.21 (2.90-3.56)	3.26 (3.05-3.44)	4.30 (4.00-4.55)	5.50 (5.00-5.98)	6.33 (5.91-7.04)	568
Non-Hispanic blacks (2001 - 2002)	3.38 (3.19-3.57)	3.35 (3.05-3.60)	4.41 (4.15-4.78)	5.87 (5.63-6.29)	6.75 (6.41-7.03)	667
Non-Hispanic blacks (2003 - 2004)	3.38 (3.21-3.56)	3.30 (3.08-3.50)	4.31 (4.02-4.62)	5.79 (5.12-6.47)	6.98 (6.38-7.18)	723
Non-Hispanic blacks (2005 - 2006)	3.47 (3.34-3.60)	3.40 (3.21-3.60)	4.47 (4.25-4.68)	5.94 (5.52-6.31)	6.95 (6.20-7.51)	692
Non-Hispanic blacks (2007 - 2008)	3.39 (3.21-3.58)	3.33 (3.18-3.54)	4.50 (4.21-4.78)	5.84 (5.41-6.18)	6.87 (5.94-7.58)	589
Non-Hispanic blacks (2009 - 2010)	3.23 (3.05-3.42)	3.20 (2.99-3.46)	4.31 (4.12-4.59)	5.88 (5.30-6.28)	6.69 (6.32-7.89)	544
Non-Hispanic whites (1999 - 2000)	4.26 (4.07-4.47)	4.28 (4.05-4.50)	5.66 (5.26-6.05)	7.27 (6.84-7.83)	8.75 (7.93-9.38)	821
Non-Hispanic whites (2001 - 2002)	4.81 (4.55-5.08)	4.63 (4.42-4.96)	6.33 (5.91-6.68)	8.46 (7.84-9.39)	10.3 (9.04-11.8)	1132
Non-Hispanic whites (2003 - 2004)	4.81 (4.52-5.12)	4.56 (4.31-4.98)	6.28 (5.95-6.71)	8.63 (7.99-9.28)	10.6 (9.43-11.0)	1074
Non-Hispanic whites (2005 - 2006)	4.82 (4.50-5.17)	4.68 (4.32-5.04)	6.41 (6.00-6.81)	9.18 (8.67-9.53)	11.0 (9.71-12.7)	1041
Non-Hispanic whites (2007 - 2008)	4.81 (4.54-5.09)	4.73 (4.42-5.12)	6.43 (6.01-6.80)	9.24 (8.20-9.82)	11.0 (10.2-11.7)	1095
Non-Hispanic whites (2009 - 2010)	4.42 (4.23-4.63)	4.36 (4.15-4.54)	6.16 (5.82-6.51)	8.13 (7.68-8.65)	9.83 (8.79-11.4)	1225

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cesium_BiomonitoringSummary.html

Urinary Cesium (creatinine corrected) (2011 – 2016)

CAS Number 7440-46-2

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	4.33 (4.13-4.53)	4.27 (4.08-4.50)	5.91 (5.63-6.33)	8.12 (7.43-8.63)	10.2 (8.93-10.7)	2501
Total population (2013 - 2014)	4.55 (4.40-4.70)	4.42 (4.24-4.64)	6.37 (6.16-6.58)	8.61 (8.32-8.86)	10.3 (9.67-10.9)	2663
Total population (2015 - 2016)	4.40 (4.21-4.59)	4.31 (4.10-4.57)	6.14 (5.79-6.50)	8.69 (7.95-9.41)	10.6 (9.62-11.1)	3058
Age 3-5 years (2015 - 2016)	8.33 (7.81-8.88)	8.15 (7.60-8.88)	11.0 (10.2-12.1)	15.0 (12.6-17.0)	17.9 (15.8-20.3)	485
Age 6-11 years (2011 - 2012)	5.56 (5.16-5.99)	5.47 (5.06-5.98)	7.15 (6.68-7.43)	9.42 (7.88-10.7)	10.7 (9.45-13.0)	398
Age 6-11 years (2013 - 2014)	6.18 (5.90-6.48)	6.25 (5.82-6.83)	8.07 (7.58-8.75)	9.96 (9.24-11.1)	11.6 (9.88-13.4)	402
Age 6-11 years (2015 - 2016)	5.62 (5.36-5.88)	5.70 (5.42-5.99)	7.13 (6.75-7.78)	9.09 (8.31-10.5)	10.8 (9.24-11.6)	379
Age 12-19 years (2011 - 2012)	3.41 (3.16-3.67)	3.35 (3.05-3.82)	4.34 (3.95-4.93)	5.30 (5.07-6.17)	6.34 (5.66-6.64)	390
Age 12-19 years (2013 - 2014)	3.75 (3.49-4.03)	3.69 (3.45-3.95)	4.79 (4.36-5.37)	6.79 (5.47-7.52)	7.52 (6.17-9.30)	451
Age 12-19 years (2015 - 2016)	3.52 (3.32-3.72)	3.44 (3.23-3.61)	4.62 (4.26-5.12)	6.02 (5.08-7.33)	7.13 (5.88-8.54)	402
Age 20+ years (2011 - 2012)	4.36 (4.15-4.59)	4.29 (4.10-4.54)	6.00 (5.65-6.45)	8.22 (7.64-8.78)	10.2 (9.47-11.2)	1713
Age 20+ years (2013 - 2014)	4.53 (4.38-4.69)	4.40 (4.18-4.67)	6.29 (6.15-6.50)	8.61 (8.30-8.86)	10.3 (9.81-10.8)	1810
Age 20+ years (2015 - 2016)	4.31 (4.08-4.55)	4.22 (3.97-4.52)	6.02 (5.50-6.43)	8.47 (7.69-9.29)	10.4 (9.41-11.0)	1792
Males (2011 - 2012)	3.93 (3.73-4.14)	3.80 (3.63-4.10)	5.31 (4.87-5.91)	7.58 (6.78-8.26)	8.80 (8.28-10.2)	1260
Males (2013 - 2014)	4.10 (3.92-4.29)	4.04 (3.79-4.29)	5.39 (5.10-5.77)	7.55 (6.83-8.11)	8.92 (8.18-10.1)	1317
Males (2015 - 2016)	4.00 (3.80-4.21)	3.90 (3.57-4.17)	5.52 (5.16-5.88)	8.22 (7.13-8.68)	10.4 (8.91-11.3)	1524
Females (2011 - 2012)	4.74 (4.52-4.97)	4.73 (4.55-4.93)	6.43 (5.91-6.82)	8.55 (8.05-9.48)	11.2 (9.48-12.5)	1241
Females (2013 - 2014)	5.02 (4.86-5.19)	5.00 (4.71-5.23)	7.08 (6.80-7.39)	9.51 (8.67-10.1)	11.3 (10.5-12.3)	1346
Females (2015 - 2016)	4.81 (4.58-5.06)	4.78 (4.47-5.08)	6.66 (6.17-7.09)	9.20 (8.40-9.82)	10.6 (10.0-11.2)	1534
Mexican Americans (2011 - 2012)	4.23 (3.96-4.51)	4.14 (3.72-4.53)	5.63 (5.11-5.91)	7.06 (6.41-8.03)	8.78 (7.48-10.3)	317
Mexican Americans (2013 - 2014)	4.56 (4.37-4.74)	4.40 (4.16-4.78)	6.02 (5.61-6.35)	7.58 (6.91-7.94)	8.92 (7.94-10.0)	453
Mexican Americans (2015 - 2016)	4.28 (4.07-4.50)	4.22 (4.01-4.50)	5.82 (5.44-6.23)	7.82 (7.28-8.37)	9.39 (8.59-10.6)	584
Non-Hispanic blacks (2011 - 2012)	3.09 (2.92-3.27)	3.12 (2.89-3.32)	4.13 (3.90-4.40)	5.31 (4.98-5.63)	6.29 (5.67-6.84)	669
Non-Hispanic blacks (2013 - 2014)	3.35 (3.20-3.52)	3.34 (3.14-3.54)	4.37 (4.14-4.63)	5.82 (5.37-6.27)	7.18 (6.25-7.86)	581
Non-Hispanic blacks (2015 - 2016)	3.29 (3.20-3.39)	3.26 (3.12-3.40)	4.57 (4.30-4.87)	6.12 (5.59-6.83)	7.48 (6.63-9.03)	669
Non-Hispanic whites (2011 - 2012)	4.56 (4.29-4.85)	4.50 (4.19-4.80)	6.34 (5.74-6.88)	8.26 (7.86-9.36)	10.3 (9.27-11.5)	818
Non-Hispanic whites (2013 - 2014)	4.70 (4.56-4.85)	4.56 (4.30-4.84)	6.63 (6.40-6.95)	8.91 (8.37-9.67)	10.5 (9.98-11.3)	984
Non-Hispanic whites (2015 - 2016)	4.51 (4.21-4.85)	4.40 (4.10-4.72)	6.24 (5.75-6.91)	8.94 (7.74-9.94)	10.6 (9.62-11.3)	924
All Hispanics (2011 - 2012)	4.25 (4.00-4.52)	4.25 (3.88-4.49)	5.69 (5.35-5.91)	7.43 (6.61-8.23)	8.67 (8.12-9.70)	573
All Hispanics (2013 - 2014)	4.51 (4.34-4.69)	4.43 (4.25-4.64)	5.89 (5.61-6.21)	7.71 (7.12-8.15)	8.93 (8.29-9.52)	701
All Hispanics (2015 - 2016)	4.39 (4.22-4.56)	4.27 (4.05-4.50)	5.97 (5.61-6.30)	8.14 (7.52-8.67)	10.1 (8.94-10.9)	981
Asians (2011 - 2012)	5.65 (5.13-6.22)	5.40 (5.12-5.95)	7.88 (6.84-9.33)	12.0 (10.1-13.7)	14.7 (12.2-19.4)	352
Asians (2013 - 2014)	6.14 (5.49-6.86)	6.12 (5.47-6.70)	8.31 (7.23-9.63)	11.5 (9.32-16.0)	16.0 (10.8-18.2)	292
Asians (2015 - 2016)	5.91 (5.50-6.35)	5.83 (5.43-6.24)	8.07 (6.72-9.42)	10.6 (9.49-12.2)	12.5 (10.7-15.3)	332

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cesium_BiomonitoringSummary.html

Blood Chromium (2015 – 2016)

CAS Number 7440-46-2

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	*	< LOD	< LOD	.700 (.540-.900)	1.08 (.750-1.49)	3442
Age 40-59 years (2015 - 2016)	*	< LOD	< LOD	.650 (.470-.970)	1.07 (.710-1.57)	1719
Age 60+ years (2015 - 2016)	*	< LOD	< LOD	.750 (.550-.940)	1.13 (.790-1.49)	1723
Males (2015 - 2016)	*	< LOD	< LOD	.620 (.460-.880)	1.07 (.680-1.58)	1656
Females (2015 - 2016)	*	< LOD	< LOD	.740 (.580-.940)	1.08 (.800-1.43)	1786
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	.570 (.460-.700)	.750 (.550-1.34)	589
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	.490 (<LOD-.740)	.870 (.690-1.10)	714
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	.750 (.550-1.07)	1.20 (.790-1.57)	1195
All Hispanics (2015 - 2016)	*	< LOD	< LOD	.550 (.430-.690)	.760 (.630-1.06)	1062
Asians (2015 - 2016)	*	< LOD	< LOD	.800 (.600-.980)	1.03 (.820-1.44)	368

Limit of detection (LOD, see Data Analysis section) for Survey year 15-16 is 0.41.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Cobalt (2015 – 2016)

CAS Number 7440-46-2

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	.151 (.146-.156)	.130 (.130-.140)	.170 (.170-.180)	.280 (.250-.300)	.400 (.370-.450)	3454
Age 40-59 years (2015 - 2016)	.144 (.138-.150)	.130 (.120-.130)	.160 (.150-.170)	.260 (.220-.290)	.360 (.300-.440)	1726
Age 60+ years (2015 - 2016)	.162 (.155-.168)	.140 (.140-.150)	.190 (.180-.200)	.300 (.270-.370)	.450 (.390-.520)	1728
Males (2015 - 2016)	.135 (.129-.142)	.120 (.120-.130)	.150 (.140-.160)	.210 (.190-.240)	.360 (.250-.400)	1661
Females (2015 - 2016)	.167 (.161-.173)	.150 (.140-.150)	.200 (.190-.210)	.320 (.280-.360)	.460 (.410-.550)	1793
Mexican Americans (2015 - 2016)	.151 (.146-.157)	.130 (.120-.140)	.170 (.160-.190)	.300 (.240-.360)	.440 (.350-.610)	592
Non-Hispanic blacks (2015 - 2016)	.148 (.138-.159)	.130 (.120-.140)	.180 (.160-.190)	.280 (.250-.340)	.440 (.390-.500)	718
Non-Hispanic whites (2015 - 2016)	.151 (.145-.157)	.130 (.130-.140)	.170 (.160-.190)	.270 (.240-.290)	.390 (.330-.450)	1198
All Hispanics (2015 - 2016)	.150 (.145-.154)	.130 (.120-.140)	.170 (.160-.180)	.300 (.240-.360)	.440 (.350-.560)	1067
Asians (2015 - 2016)	.152 (.145-.160)	.140 (.130-.150)	.170 (.160-.180)	.290 (.210-.370)	.380 (.290-.620)	368

Limit of detection (LOD, see Data Analysis section) for Survey year 15-16 is 0.06.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cobalt_BiomonitoringSummary.html

Urinary Cobalt (1999 – 2010)

CAS Number 7440-48-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.375 (.336-.419)	.410 (.370-.450)	.630 (.570-.680)	.950 (.890-1.03)	1.32 (1.16-1.48)	2465
Total population (2001 - 2002)	.379 (.355-.404)	.410 (.380-.430)	.610 (.570-.660)	.940 (.870-1.00)	1.28 (1.15-1.44)	2690
Total population (2003 - 2004)	.316 (.291-.343)	.330 (.300-.350)	.520 (.490-.550)	.820 (.750-.890)	1.16 (1.08-1.26)	2558
Total population (2005 - 2006)	.374 (.357-.392)	.390 (.370-.410)	.600 (.560-.630)	.880 (.840-.950)	1.33 (1.17-1.47)	2576
Total population (2007 - 2008)	.369 (.351-.389)	.380 (.360-.390)	.580 (.550-.600)	.920 (.840-1.01)	1.32 (1.10-1.43)	2627
Total population (2009 - 2010)	.369 (.341-.398)	.380 (.350-.400)	.600 (.560-.650)	.960 (.870-1.06)	1.40 (1.20-1.58)	2848
Age 6-11 years (1999 - 2000)	.499 (.427-.583)	.530 (.450-.640)	.750 (.610-.900)	1.03 (.880-1.12)	1.22 (1.03-1.50)	340
Age 6-11 years (2001 - 2002)	.452 (.377-.543)	.520 (.430-.610)	.710 (.670-.810)	1.07 (.940-1.21)	1.32 (1.17-1.53)	368
Age 6-11 years (2003 - 2004)	.454 (.393-.523)	.460 (.410-.520)	.750 (.590-.900)	1.24 (.910-1.47)	1.68 (1.26-1.81)	290
Age 6-11 years (2005 - 2006)	.424 (.383-.468)	.450 (.410-.490)	.660 (.580-.710)	.870 (.830-1.04)	1.16 (.910-1.39)	355
Age 6-11 years (2007 - 2008)	.433 (.367-.509)	.450 (.360-.550)	.700 (.560-.810)	.960 (.790-1.28)	1.40 (.880-1.82)	394
Age 6-11 years (2009 - 2010)	.424 (.379-.474)	.440 (.400-.490)	.670 (.610-.740)	.960 (.850-1.10)	1.14 (1.01-1.69)	378
Age 12-19 years (1999 - 2000)	.519 (.463-.581)	.520 (.490-.570)	.820 (.670-.890)	1.17 (1.01-1.47)	1.52 (1.26-2.56)	719
Age 12-19 years (2001 - 2002)	.515 (.469-.564)	.520 (.480-.570)	.750 (.690-.840)	1.24 (1.07-1.32)	1.59 (1.37-1.99)	762
Age 12-19 years (2003 - 2004)	.461 (.428-.496)	.480 (.450-.520)	.740 (.650-.800)	1.03 (.940-1.23)	1.60 (1.14-1.92)	725
Age 12-19 years (2005 - 2006)	.510 (.451-.577)	.500 (.460-.570)	.820 (.690-.980)	1.30 (1.08-1.40)	1.74 (1.39-2.08)	701
Age 12-19 years (2007 - 2008)	.529 (.478-.585)	.510 (.450-.570)	.820 (.690-.960)	1.36 (1.09-1.53)	1.70 (1.40-1.78)	376
Age 12-19 years (2009 - 2010)	.465 (.406-.533)	.460 (.430-.530)	.830 (.710-.920)	1.21 (1.05-1.51)	1.56 (1.19-2.11)	451
Age 20+ years (1999 - 2000)	.343 (.305-.386)	.370 (.330-.420)	.570 (.520-.640)	.880 (.810-.980)	1.28 (1.07-1.39)	1406
Age 20+ years (2001 - 2002)	.352 (.333-.373)	.380 (.350-.410)	.560 (.520-.590)	.860 (.800-.930)	1.15 (1.04-1.42)	1560
Age 20+ years (2003 - 2004)	.285 (.259-.313)	.300 (.270-.330)	.460 (.410-.510)	.690 (.660-.730)	1.06 (.890-1.14)	1543
Age 20+ years (2005 - 2006)	.351 (.332-.371)	.370 (.350-.390)	.550 (.520-.600)	.810 (.760-.880)	1.30 (1.05-1.47)	1520
Age 20+ years (2007 - 2008)	.343 (.326-.362)	.350 (.340-.370)	.530 (.500-.560)	.830 (.750-.920)	1.20 (1.00-1.38)	1857
Age 20+ years (2009 - 2010)	.351 (.322-.382)	.350 (.330-.380)	.570 (.520-.630)	.890 (.800-1.02)	1.35 (1.12-1.58)	2019
Males (1999 - 2000)	.371 (.331-.416)	.410 (.370-.450)	.580 (.540-.640)	.820 (.740-.900)	1.01 (.900-1.12)	1227
Males (2001 - 2002)	.367 (.338-.399)	.390 (.360-.420)	.550 (.520-.600)	.790 (.740-.850)	1.05 (.960-1.14)	1335
Males (2003 - 2004)	.294 (.270-.319)	.320 (.290-.340)	.480 (.440-.500)	.670 (.620-.710)	.870 (.790-.920)	1281
Males (2005 - 2006)	.369 (.354-.383)	.380 (.370-.400)	.540 (.510-.570)	.760 (.690-.850)	1.06 (.910-1.27)	1271
Males (2007 - 2008)	.350 (.330-.371)	.370 (.350-.390)	.530 (.500-.560)	.750 (.690-.820)	1.00 (.860-1.14)	1327
Males (2009 - 2010)	.336 (.307-.368)	.360 (.330-.380)	.530 (.480-.570)	.750 (.690-.850)	.960 (.850-1.12)	1398
Females (1999 - 2000)	.379 (.333-.431)	.410 (.340-.460)	.680 (.590-.790)	1.17 (.930-1.36)	1.50 (1.28-2.05)	1238
Females (2001 - 2002)	.390 (.364-.417)	.430 (.400-.450)	.670 (.620-.700)	1.06 (.980-1.16)	1.46 (1.22-1.81)	1355
Females (2003 - 2004)	.339 (.308-.372)	.340 (.310-.370)	.580 (.540-.610)	1.04 (.900-1.13)	1.47 (1.33-1.73)	1277
Females (2005 - 2006)	.379 (.351-.409)	.410 (.370-.440)	.660 (.620-.700)	1.04 (.900-1.21)	1.54 (1.30-1.93)	1305
Females (2007 - 2008)	.389 (.367-.411)	.390 (.360-.410)	.650 (.590-.690)	1.08 (.980-1.26)	1.43 (1.34-1.62)	1300
Females (2009 - 2010)	.403 (.364-.447)	.400 (.360-.440)	.700 (.640-.770)	1.19 (1.05-1.36)	1.68 (1.51-2.11)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.07, 0.07, 0.08, 0.041, 0.041, and 0.041 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cobalt_BiomonitoringSummary.html

Urinary Cobalt (1999 – 2010)

CAS Number 7440-48-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.418 (.348-.502)	.470 (.370-.530)	.670 (.630-.770)	1.05 (.950-1.19)	1.47 (1.25-1.67)	884
Mexican Americans (2001 - 2002)	.398 (.373-.424)	.430 (.410-.450)	.650 (.600-.710)	.950 (.850-1.03)	1.20 (1.06-1.48)	683
Mexican Americans (2003 - 2004)	.374 (.350-.398)	.350 (.340-.390)	.580 (.530-.620)	1.09 (.920-1.16)	1.33 (1.16-1.73)	618
Mexican Americans (2005 - 2006)	.437 (.404-.473)	.450 (.420-.500)	.680 (.620-.720)	1.11 (.940-1.30)	1.58 (1.33-1.79)	652
Mexican Americans (2007 - 2008)	.396 (.349-.450)	.400 (.330-.480)	.610 (.560-.710)	.980 (.870-1.08)	1.26 (1.05-1.69)	515
Mexican Americans (2009 - 2010)	.378 (.351-.407)	.380 (.360-.410)	.590 (.560-.640)	.920 (.860-1.04)	1.24 (1.04-1.58)	613
Non-Hispanic blacks (1999 - 2000)	.434 (.405-.465)	.430 (.390-.470)	.680 (.620-.760)	1.17 (1.04-1.26)	1.45 (1.23-2.04)	568
Non-Hispanic blacks (2001 - 2002)	.435 (.388-.487)	.420 (.380-.460)	.650 (.540-.810)	1.16 (.850-1.64)	1.75 (1.32-2.22)	667
Non-Hispanic blacks (2003 - 2004)	.380 (.348-.414)	.380 (.360-.410)	.600 (.540-.680)	1.01 (.890-1.09)	1.28 (1.01-2.03)	723
Non-Hispanic blacks (2005 - 2006)	.412 (.374-.453)	.410 (.360-.440)	.600 (.560-.670)	.930 (.830-1.11)	1.47 (1.12-2.00)	692
Non-Hispanic blacks (2007 - 2008)	.403 (.367-.443)	.390 (.360-.420)	.620 (.560-.740)	1.06 (.880-1.31)	1.57 (1.22-1.86)	589
Non-Hispanic blacks (2009 - 2010)	.368 (.335-.403)	.380 (.340-.400)	.590 (.520-.650)	.990 (.870-1.15)	1.47 (1.20-1.58)	544
Non-Hispanic whites (1999 - 2000)	.369 (.316-.431)	.410 (.350-.460)	.630 (.550-.700)	.930 (.830-1.08)	1.29 (1.02-1.65)	822
Non-Hispanic whites (2001 - 2002)	.359 (.327-.394)	.390 (.360-.430)	.590 (.520-.660)	.870 (.800-.950)	1.16 (1.04-1.32)	1132
Non-Hispanic whites (2003 - 2004)	.301 (.270-.334)	.310 (.280-.340)	.500 (.460-.540)	.760 (.690-.850)	1.09 (.950-1.26)	1074
Non-Hispanic whites (2005 - 2006)	.361 (.340-.384)	.380 (.360-.410)	.580 (.530-.630)	.860 (.800-.940)	1.30 (1.06-1.50)	1041
Non-Hispanic whites (2007 - 2008)	.358 (.338-.379)	.370 (.350-.390)	.560 (.520-.600)	.900 (.780-1.00)	1.32 (1.02-1.46)	1095
Non-Hispanic whites (2009 - 2010)	.369 (.335-.408)	.370 (.350-.400)	.600 (.540-.660)	.970 (.850-1.10)	1.40 (1.17-1.64)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.07, 0.07, 0.08, 0.041, 0.041, and 0.041 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cobalt_BiomonitoringSummary.html

Urinary Cobalt (2011 – 2016)

CAS Number 7440-48-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.326 (.309-.344)	.323 (.306-.347)	.543 (.510-.577)	.860 (.800-.979)	1.27 (1.09-1.45)	2504
Total population (2013 - 2014)	.391 (.373-.411)	.408 (.382-.435)	.687 (.662-.713)	1.04 (.976-1.09)	1.35 (1.23-1.48)	2664
Total population (2015 - 2016)	.414 (.394-.435)	.434 (.415-.455)	.687 (.658-.725)	1.06 (.983-1.12)	1.53 (1.34-1.71)	3061
Age 3-5 years (2015 - 2016)	.426 (.397-.456)	.466 (.410-.512)	.739 (.662-.833)	1.08 (.947-1.25)	1.55 (1.23-2.07)	486
Age 6-11 years (2011 - 2012)	.397 (.356-.442)	.452 (.361-.510)	.704 (.616-.772)	1.00 (.846-1.38)	1.42 (1.00-1.78)	399
Age 6-11 years (2013 - 2014)	.447 (.411-.487)	.479 (.408-.522)	.789 (.718-.877)	1.05 (.991-1.33)	1.55 (1.14-1.84)	402
Age 6-11 years (2015 - 2016)	.534 (.494-.577)	.599 (.525-.636)	.886 (.773-.948)	1.20 (.992-1.40)	1.63 (1.20-2.05)	379
Age 12-19 years (2011 - 2012)	.416 (.358-.484)	.429 (.341-.527)	.700 (.622-.806)	1.12 (.960-1.30)	1.56 (1.16-1.96)	390
Age 12-19 years (2013 - 2014)	.549 (.462-.653)	.602 (.491-.701)	.936 (.783-1.05)	1.43 (1.08-1.75)	1.76 (1.49-3.07)	451
Age 12-19 years (2015 - 2016)	.571 (.527-.620)	.604 (.535-.659)	.892 (.840-1.08)	1.48 (1.32-1.74)	1.92 (1.57-2.23)	402
Age 20+ years (2011 - 2012)	.307 (.288-.327)	.308 (.289-.328)	.491 (.457-.534)	.800 (.695-.940)	1.16 (.984-1.36)	1715
Age 20+ years (2013 - 2014)	.367 (.349-.386)	.382 (.357-.410)	.647 (.614-.673)	.930 (.882-1.04)	1.23 (1.17-1.34)	1811
Age 20+ years (2015 - 2016)	.385 (.364-.408)	.403 (.379-.427)	.638 (.599-.666)	.949 (.877-1.06)	1.41 (1.21-1.66)	1794
Males (2011 - 2012)	.317 (.299-.336)	.316 (.293-.339)	.496 (.452-.547)	.715 (.659-.798)	.963 (.858-1.03)	1262
Males (2013 - 2014)	.380 (.355-.407)	.414 (.374-.452)	.641 (.604-.684)	.883 (.820-.951)	1.11 (1.04-1.26)	1318
Males (2015 - 2016)	.397 (.376-.420)	.434 (.405-.466)	.651 (.609-.692)	.860 (.815-.954)	1.08 (.960-1.19)	1524
Females (2011 - 2012)	.335 (.310-.361)	.340 (.308-.382)	.591 (.554-.643)	1.07 (.891-1.20)	1.49 (1.30-1.74)	1242
Females (2013 - 2014)	.402 (.374-.432)	.398 (.366-.438)	.741 (.701-.789)	1.16 (1.06-1.23)	1.50 (1.36-1.75)	1346
Females (2015 - 2016)	.432 (.397-.469)	.433 (.391-.489)	.752 (.675-.865)	1.33 (1.20-1.43)	1.82 (1.54-2.13)	1537
Mexican Americans (2011 - 2012)	.350 (.322-.381)	.350 (.307-.377)	.550 (.490-.598)	.891 (.721-1.18)	1.41 (1.14-2.08)	317
Mexican Americans (2013 - 2014)	.415 (.378-.456)	.439 (.400-.482)	.686 (.610-.766)	.918 (.866-1.09)	1.15 (1.06-1.56)	453
Mexican Americans (2015 - 2016)	.469 (.431-.511)	.488 (.431-.558)	.777 (.688-.852)	1.21 (1.01-1.42)	1.81 (1.32-2.14)	585
Non-Hispanic blacks (2011 - 2012)	.340 (.311-.373)	.333 (.304-.358)	.519 (.489-.576)	.909 (.790-.986)	1.44 (1.06-1.60)	669
Non-Hispanic blacks (2013 - 2014)	.468 (.410-.535)	.471 (.402-.561)	.796 (.691-.877)	1.26 (1.03-1.39)	1.50 (1.35-1.67)	581
Non-Hispanic blacks (2015 - 2016)	.461 (.422-.503)	.478 (.436-.513)	.740 (.660-.845)	1.20 (.956-1.40)	1.52 (1.34-1.85)	671
Non-Hispanic whites (2011 - 2012)	.320 (.295-.348)	.320 (.296-.357)	.543 (.485-.591)	.858 (.750-.995)	1.20 (1.03-1.35)	820
Non-Hispanic whites (2013 - 2014)	.374 (.349-.401)	.387 (.345-.429)	.681 (.638-.723)	1.02 (.930-1.10)	1.34 (1.21-1.56)	985
Non-Hispanic whites (2015 - 2016)	.402 (.374-.432)	.422 (.386-.454)	.675 (.627-.734)	1.00 (.938-1.11)	1.49 (1.24-1.71)	924
All Hispanics (2011 - 2012)	.338 (.321-.357)	.326 (.306-.350)	.530 (.490-.583)	.891 (.763-1.14)	1.41 (1.10-1.81)	573
All Hispanics (2013 - 2014)	.412 (.384-.442)	.442 (.409-.481)	.674 (.631-.731)	.964 (.891-1.07)	1.20 (1.09-1.36)	701
All Hispanics (2015 - 2016)	.440 (.417-.465)	.465 (.431-.514)	.718 (.662-.795)	1.16 (.991-1.34)	1.69 (1.34-2.03)	982
Asians (2011 - 2012)	.317 (.282-.357)	.323 (.300-.355)	.519 (.445-.634)	.968 (.723-1.58)	1.78 (.980-2.31)	353
Asians (2013 - 2014)	.362 (.315-.416)	.354 (.312-.434)	.653 (.578-.789)	1.05 (.854-1.25)	1.57 (1.09-2.26)	292
Asians (2015 - 2016)	.376 (.334-.424)	.365 (.342-.438)	.610 (.533-.698)	.990 (.734-1.37)	1.44 (.990-2.31)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.048, 0.023, and 0.023, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cobalt_BiomonitoringSummary.html

Urinary Cobalt (creatinine corrected) (1999 – 2010)

CAS Number 7440-48-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.353 (.319-.391)	.328 (.302-.365)	.515 (.457-.581)	.821 (.679-.963)	1.16 (.938-1.50)	2465
Total population (2001 - 2002)	.358 (.333-.384)	.335 (.313-.360)	.523 (.487-.562)	.844 (.750-.955)	1.16 (1.00-1.28)	2689
Total population (2003 - 2004)	.314 (.303-.325)	.290 (.278-.306)	.455 (.434-.481)	.737 (.703-.781)	1.02 (.911-1.10)	2558
Total population (2005 - 2006)	.368 (.353-.384)	.340 (.320-.360)	.520 (.490-.550)	.810 (.750-.920)	1.17 (.990-1.27)	2576
Total population (2007 - 2008)	.385 (.366-.406)	.360 (.350-.380)	.560 (.520-.590)	.870 (.760-.990)	1.22 (1.01-1.46)	2627
Total population (2009 - 2010)	.393 (.372-.415)	.370 (.350-.390)	.560 (.530-.600)	.890 (.830-.940)	1.29 (1.08-1.49)	2848
Age 6-11 years (1999 - 2000)	.547 (.467-.640)	.554 (.449-.647)	.774 (.626-.938)	1.00 (.833-1.49)	1.25 (.895-1.50)	340
Age 6-11 years (2001 - 2002)	.552 (.508-.599)	.548 (.503-.609)	.756 (.660-.829)	1.00 (.900-1.27)	1.30 (1.03-1.73)	368
Age 6-11 years (2003 - 2004)	.529 (.471-.593)	.500 (.463-.543)	.689 (.634-.750)	1.04 (.760-1.29)	1.29 (1.04-1.36)	290
Age 6-11 years (2005 - 2006)	.523 (.494-.554)	.520 (.480-.570)	.720 (.660-.760)	.900 (.840-1.04)	1.27 (.980-1.45)	355
Age 6-11 years (2007 - 2008)	.564 (.501-.635)	.580 (.500-.630)	.760 (.660-.910)	1.12 (.830-1.46)	1.39 (1.06-1.81)	394
Age 6-11 years (2009 - 2010)	.578 (.538-.620)	.570 (.530-.620)	.760 (.690-.840)	1.06 (.920-1.21)	1.26 (1.06-1.58)	378
Age 12-19 years (1999 - 2000)	.391 (.353-.433)	.378 (.329-.407)	.537 (.469-.595)	.824 (.638-1.17)	1.44 (.821-3.54)	719
Age 12-19 years (2001 - 2002)	.368 (.343-.396)	.352 (.327-.372)	.534 (.471-.611)	.851 (.673-.949)	1.06 (.932-1.24)	762
Age 12-19 years (2003 - 2004)	.329 (.304-.355)	.316 (.277-.348)	.495 (.442-.561)	.738 (.630-.847)	.952 (.792-1.09)	725
Age 12-19 years (2005 - 2006)	.392 (.360-.427)	.360 (.330-.400)	.530 (.480-.620)	.810 (.720-.920)	1.02 (.870-1.48)	701
Age 12-19 years (2007 - 2008)	.414 (.382-.448)	.390 (.340-.450)	.610 (.520-.700)	.880 (.750-1.13)	1.17 (.890-1.35)	376
Age 12-19 years (2009 - 2010)	.435 (.398-.476)	.410 (.370-.470)	.610 (.550-.700)	.960 (.790-1.07)	1.30 (1.00-1.53)	451
Age 20+ years (1999 - 2000)	.328 (.297-.362)	.306 (.280-.328)	.471 (.428-.522)	.727 (.632-.905)	1.12 (.861-1.36)	1406
Age 20+ years (2001 - 2002)	.337 (.313-.363)	.313 (.294-.337)	.475 (.435-.513)	.792 (.704-.955)	1.15 (.963-1.33)	1559
Age 20+ years (2003 - 2004)	.293 (.282-.304)	.271 (.257-.286)	.400 (.380-.429)	.691 (.616-.744)	.976 (.829-1.10)	1543
Age 20+ years (2005 - 2006)	.350 (.334-.367)	.320 (.300-.340)	.490 (.450-.520)	.780 (.690-.940)	1.17 (.970-1.31)	1520
Age 20+ years (2007 - 2008)	.366 (.348-.384)	.340 (.330-.360)	.510 (.480-.540)	.830 (.720-.960)	1.19 (.980-1.47)	1857
Age 20+ years (2009 - 2010)	.371 (.350-.394)	.340 (.320-.360)	.520 (.490-.550)	.840 (.750-.930)	1.29 (1.02-1.52)	2019
Males (1999 - 2000)	.290 (.259-.324)	.279 (.248-.301)	.402 (.365-.449)	.608 (.534-.728)	.838 (.667-1.10)	1227
Males (2001 - 2002)	.290 (.272-.310)	.278 (.256-.297)	.392 (.361-.425)	.644 (.574-.707)	.848 (.786-.929)	1334
Males (2003 - 2004)	.247 (.237-.259)	.234 (.215-.250)	.333 (.313-.352)	.513 (.476-.585)	.700 (.630-.753)	1281
Males (2005 - 2006)	.302 (.289-.317)	.290 (.270-.300)	.410 (.370-.440)	.610 (.580-.640)	.770 (.710-.850)	1271
Males (2007 - 2008)	.313 (.298-.329)	.300 (.280-.310)	.420 (.400-.440)	.630 (.580-.680)	.830 (.680-1.02)	1327
Males (2009 - 2010)	.306 (.290-.323)	.290 (.280-.300)	.420 (.390-.450)	.630 (.570-.690)	.810 (.720-.920)	1398
Females (1999 - 2000)	.426 (.378-.479)	.407 (.362-.457)	.606 (.550-.694)	.960 (.781-1.29)	1.50 (1.11-1.83)	1238
Females (2001 - 2002)	.435 (.404-.468)	.408 (.382-.438)	.635 (.560-.708)	1.00 (.879-1.19)	1.29 (1.12-1.60)	1355
Females (2003 - 2004)	.393 (.378-.409)	.361 (.342-.381)	.554 (.513-.615)	.937 (.850-1.00)	1.29 (1.10-1.33)	1277
Females (2005 - 2006)	.445 (.423-.468)	.420 (.400-.440)	.630 (.590-.700)	.990 (.900-1.17)	1.34 (1.18-1.60)	1305
Females (2007 - 2008)	.470 (.442-.499)	.450 (.430-.480)	.690 (.630-.750)	1.09 (.930-1.27)	1.46 (1.26-1.69)	1300
Females (2009 - 2010)	.498 (.465-.534)	.460 (.450-.480)	.690 (.650-.720)	1.09 (.990-1.33)	1.64 (1.34-2.15)	1450

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cobalt_BiomonitoringSummary.html

Urinary Cobalt (creatinine corrected) (1999 – 2010)

CAS Number 7440-48-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.386 (.339-.439)	.376 (.333-.419)	.598 (.500-.669)	.898 (.826-1.00)	1.23 (1.11-1.35)	884
Mexican Americans (2001 - 2002)	.388 (.361-.417)	.361 (.333-.394)	.591 (.500-.662)	.872 (.777-.990)	1.10 (.990-1.27)	682
Mexican Americans (2003 - 2004)	.346 (.326-.368)	.327 (.296-.349)	.542 (.487-.594)	.850 (.753-.963)	1.14 (.963-1.35)	618
Mexican Americans (2005 - 2006)	.411 (.388-.436)	.380 (.360-.400)	.580 (.520-.650)	.900 (.820-1.02)	1.19 (1.05-1.35)	652
Mexican Americans (2007 - 2008)	.396 (.348-.450)	.370 (.330-.410)	.560 (.470-.690)	.900 (.770-1.12)	1.17 (.990-1.54)	515
Mexican Americans (2009 - 2010)	.396 (.367-.427)	.380 (.340-.420)	.590 (.530-.650)	.930 (.820-1.03)	1.22 (1.04-1.30)	613
Non-Hispanic blacks (1999 - 2000)	.282 (.275-.289)	.257 (.243-.279)	.417 (.378-.462)	.723 (.600-.785)	.975 (.757-1.60)	568
Non-Hispanic blacks (2001 - 2002)	.298 (.275-.323)	.268 (.251-.296)	.444 (.393-.505)	.728 (.582-.917)	1.03 (.740-1.55)	667
Non-Hispanic blacks (2003 - 2004)	.273 (.248-.300)	.259 (.239-.281)	.388 (.344-.461)	.700 (.563-.842)	.964 (.733-1.15)	723
Non-Hispanic blacks (2005 - 2006)	.299 (.281-.318)	.280 (.240-.300)	.420 (.380-.460)	.700 (.570-.780)	.950 (.790-1.17)	692
Non-Hispanic blacks (2007 - 2008)	.295 (.277-.314)	.270 (.260-.290)	.420 (.390-.450)	.710 (.570-.860)	1.07 (.850-1.28)	589
Non-Hispanic blacks (2009 - 2010)	.291 (.271-.314)	.280 (.240-.310)	.420 (.380-.480)	.700 (.610-.750)	.840 (.750-1.06)	544
Non-Hispanic whites (1999 - 2000)	.369 (.324-.421)	.352 (.313-.387)	.533 (.452-.611)	.861 (.667-1.16)	1.25 (.895-1.57)	822
Non-Hispanic whites (2001 - 2002)	.362 (.331-.396)	.343 (.313-.368)	.523 (.479-.562)	.830 (.736-.983)	1.16 (.983-1.33)	1132
Non-Hispanic whites (2003 - 2004)	.317 (.301-.334)	.291 (.274-.309)	.457 (.425-.488)	.738 (.683-.804)	1.00 (.857-1.13)	1074
Non-Hispanic whites (2005 - 2006)	.376 (.357-.395)	.350 (.330-.370)	.520 (.490-.580)	.810 (.710-.950)	1.18 (.950-1.43)	1041
Non-Hispanic whites (2007 - 2008)	.401 (.380-.423)	.380 (.360-.400)	.590 (.530-.630)	.890 (.760-1.06)	1.27 (.980-1.55)	1095
Non-Hispanic whites (2009 - 2010)	.413 (.388-.440)	.390 (.360-.410)	.580 (.530-.620)	.910 (.830-.980)	1.33 (1.08-1.58)	1225

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cobalt_BiomonitoringSummary.html

Urinary Cobalt (creatinine corrected) (2011 – 2016)

CAS Number 7440-48-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.370 (.349-.391)	.347 (.330-.371)	.557 (.513-.593)	.880 (.768-1.03)	1.29 (1.12-1.46)	2502
Total population (2013 - 2014)	.452 (.437-.466)	.443 (.427-.454)	.656 (.625-.688)	.969 (.920-1.03)	1.31 (1.18-1.47)	2663
Total population (2015 - 2016)	.465 (.447-.484)	.444 (.421-.464)	.682 (.636-.722)	1.07 (.999-1.16)	1.39 (1.24-1.52)	3058
Age 3-5 years (2015 - 2016)	.980 (.919-1.05)	.952 (.875-1.01)	1.35 (1.22-1.48)	1.94 (1.65-2.10)	2.45 (2.03-2.98)	485
Age 6-11 years (2011 - 2012)	.567 (.535-.602)	.571 (.526-.611)	.778 (.713-.834)	1.19 (.974-1.30)	1.38 (1.10-1.67)	398
Age 6-11 years (2013 - 2014)	.667 (.614-.725)	.646 (.593-.704)	.914 (.853-.986)	1.26 (1.09-1.40)	1.57 (1.24-2.13)	402
Age 6-11 years (2015 - 2016)	.757 (.701-.817)	.732 (.658-.785)	1.03 (.957-1.11)	1.37 (1.17-1.50)	1.70 (1.28-2.64)	379
Age 12-19 years (2011 - 2012)	.398 (.349-.455)	.373 (.316-.441)	.585 (.454-.700)	.832 (.688-1.09)	1.26 (.830-2.77)	390
Age 12-19 years (2013 - 2014)	.497 (.463-.534)	.480 (.446-.525)	.692 (.597-.769)	.920 (.819-1.10)	1.30 (1.09-1.61)	451
Age 12-19 years (2015 - 2016)	.534 (.504-.565)	.508 (.455-.552)	.799 (.697-.939)	1.16 (1.05-1.42)	1.50 (1.33-1.78)	402
Age 20+ years (2011 - 2012)	.349 (.330-.369)	.327 (.300-.341)	.508 (.467-.552)	.803 (.711-.982)	1.24 (1.10-1.50)	1714
Age 20+ years (2013 - 2014)	.428 (.412-.444)	.417 (.390-.441)	.607 (.580-.643)	.929 (.853-.994)	1.27 (1.10-1.46)	1810
Age 20+ years (2015 - 2016)	.420 (.402-.439)	.404 (.384-.426)	.582 (.551-.616)	.900 (.809-1.03)	1.20 (1.05-1.41)	1792
Males (2011 - 2012)	.297 (.280-.315)	.276 (.254-.294)	.426 (.397-.456)	.637 (.564-.750)	.865 (.748-1.17)	1261
Males (2013 - 2014)	.379 (.362-.398)	.368 (.344-.390)	.529 (.493-.560)	.758 (.689-.852)	1.02 (.871-1.29)	1317
Males (2015 - 2016)	.377 (.360-.395)	.348 (.334-.379)	.526 (.483-.550)	.839 (.746-.913)	1.08 (.966-1.18)	1524
Females (2011 - 2012)	.455 (.418-.496)	.433 (.407-.466)	.660 (.600-.729)	1.10 (.900-1.36)	1.54 (1.28-1.84)	1241
Females (2013 - 2014)	.534 (.515-.553)	.532 (.502-.549)	.774 (.733-.816)	1.12 (.991-1.27)	1.48 (1.27-1.77)	1346
Females (2015 - 2016)	.568 (.540-.598)	.533 (.511-.563)	.799 (.760-.869)	1.24 (1.16-1.40)	1.70 (1.48-1.98)	1534
Mexican Americans (2011 - 2012)	.394 (.357-.435)	.374 (.322-.400)	.576 (.531-.637)	1.02 (.877-1.24)	1.50 (.988-2.02)	317
Mexican Americans (2013 - 2014)	.474 (.449-.500)	.448 (.425-.473)	.669 (.610-.721)	.971 (.888-1.03)	1.28 (1.03-1.51)	453
Mexican Americans (2015 - 2016)	.512 (.479-.548)	.488 (.464-.533)	.771 (.690-.850)	1.18 (1.01-1.40)	1.50 (1.37-1.79)	584
Non-Hispanic blacks (2011 - 2012)	.265 (.248-.282)	.244 (.222-.267)	.401 (.342-.457)	.645 (.559-.816)	1.02 (.737-1.41)	669
Non-Hispanic blacks (2013 - 2014)	.356 (.332-.382)	.337 (.315-.377)	.545 (.490-.624)	.841 (.754-.952)	1.08 (.930-1.22)	581
Non-Hispanic blacks (2015 - 2016)	.366 (.347-.386)	.342 (.328-.377)	.556 (.504-.595)	.799 (.696-.972)	1.07 (.929-1.24)	669
Non-Hispanic whites (2011 - 2012)	.387 (.360-.417)	.365 (.336-.400)	.574 (.513-.615)	.860 (.749-1.09)	1.29 (1.04-1.57)	818
Non-Hispanic whites (2013 - 2014)	.461 (.442-.480)	.447 (.430-.469)	.669 (.613-.703)	.987 (.912-1.13)	1.32 (1.19-1.61)	984
Non-Hispanic whites (2015 - 2016)	.475 (.453-.497)	.457 (.427-.471)	.686 (.629-.746)	1.07 (.972-1.20)	1.41 (1.19-1.63)	924
All Hispanics (2011 - 2012)	.379 (.351-.409)	.361 (.322-.384)	.572 (.520-.626)	.944 (.809-1.15)	1.33 (1.13-1.91)	573
All Hispanics (2013 - 2014)	.460 (.444-.475)	.448 (.429-.464)	.663 (.619-.703)	.952 (.888-1.00)	1.17 (1.03-1.35)	701
All Hispanics (2015 - 2016)	.497 (.468-.527)	.465 (.436-.503)	.748 (.669-.837)	1.16 (1.04-1.28)	1.46 (1.35-1.70)	981
Asians (2011 - 2012)	.424 (.378-.475)	.386 (.329-.457)	.659 (.531-.785)	1.18 (.907-1.51)	1.61 (1.14-2.72)	353
Asians (2013 - 2014)	.567 (.516-.624)	.540 (.482-.567)	.814 (.670-.931)	1.38 (1.07-1.97)	2.09 (1.39-3.78)	292
Asians (2015 - 2016)	.514 (.473-.559)	.475 (.421-.548)	.736 (.624-.885)	1.30 (1.11-1.57)	1.66 (1.44-2.12)	332

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Cobalt_BiomonitoringSummary.html

Serum Copper (2011 – 2014)

CAS Number 7440-50-8

Geometric mean and selected percentiles of serum concentrations (in µg/dL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	114 (111-116)	112 (109-114)	130 (127-134)	152 (145-162)	169 (161-183)	2329
Total population (2013 - 2014)	115 (112-118)	114 (110-117)	132 (129-135)	155 (150-160)	171 (165-180)	2520
Age 6-11 years (2011 - 2012)	120 (117-124)	121 (115-126)	135 (130-140)	154 (141-161)	164 (154-175)	316
Age 6-11 years (2013 - 2014)	119 (114-123)	119 (114-123)	132 (127-141)	148 (143-155)	157 (148-175)	339
Age 12-19 years (2011 - 2012)	106 (103-110)	103 (99.7-106)	120 (115-125)	143 (130-161)	169 (141-199)	366
Age 12-19 years (2013 - 2014)	106 (103-108)	104 (101-106)	120 (116-125)	141 (132-147)	164 (146-181)	418
Age 20+ years (2011 - 2012)	114 (111-117)	112 (109-115)	131 (127-136)	153 (145-164)	171 (162-184)	1647
Age 20+ years (2013 - 2014)	116 (113-119)	114 (111-118)	134 (131-136)	157 (150-164)	175 (165-183)	1763
Males (2011 - 2012)	103 (101-106)	103 (101-105)	116 (114-119)	132 (126-139)	143 (135-155)	1162
Males (2013 - 2014)	103 (99.8-107)	103 (101-106)	117 (113-122)	131 (125-137)	141 (134-148)	1235
Females (2011 - 2012)	124 (121-127)	123 (119-125)	142 (137-147)	165 (160-172)	187 (173-207)	1167
Females (2013 - 2014)	127 (124-130)	124 (122-128)	145 (142-149)	168 (162-176)	191 (175-214)	1285
Mexican Americans (2011 - 2012)	111 (107-116)	109 (105-115)	125 (122-131)	144 (137-152)	156 (148-164)	285
Mexican Americans (2013 - 2014)	116 (113-120)	116 (110-119)	135 (128-142)	157 (147-164)	174 (162-182)	431
Non-Hispanic blacks (2011 - 2012)	126 (122-130)	127 (121-130)	147 (142-151)	168 (161-180)	191 (176-214)	620
Non-Hispanic blacks (2013 - 2014)	125 (121-129)	124 (120-128)	147 (143-151)	165 (159-170)	176 (169-188)	516
Non-Hispanic whites (2011 - 2012)	113 (110-115)	111 (109-113)	128 (125-132)	150 (141-163)	169 (155-192)	780
Non-Hispanic whites (2013 - 2014)	113 (110-116)	111 (109-114)	130 (125-133)	150 (144-158)	168 (158-188)	975
All Hispanics (2011 - 2012)	112 (108-115)	109 (106-115)	128 (124-132)	145 (139-152)	158 (151-164)	525
All Hispanics (2013 - 2014)	117 (113-121)	116 (111-120)	136 (129-142)	157 (148-164)	171 (162-182)	666
Asians (2011 - 2012)	105 (102-109)	101 (96.2-107)	120 (114-125)	143 (132-151)	166 (150-198)	323
Asians (2013 - 2014)	107 (104-111)	104 (99.8-108)	125 (116-130)	146 (132-162)	162 (145-186)	267

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 2.5 and 2.5, respectively.

Blood Lead (1999 – 2010)

CAS Number 7439-92-1

Geometric mean and selected percentiles of blood concentrations (in µg/dL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	1.66 (1.60-1.72)	1.60 (1.60-1.70)	2.50 (2.40-2.60)	3.80 (3.60-4.00)	5.00 (4.70-5.50)	7970
Total population (2001 - 2002)	1.45 (1.39-1.51)	1.40 (1.40-1.50)	2.20 (2.10-2.30)	3.40 (3.20-3.60)	4.50 (4.20-4.70)	8945
Total population (2003 - 2004)	1.43 (1.36-1.50)	1.40 (1.30-1.50)	2.10 (2.10-2.20)	3.20 (3.10-3.30)	4.20 (3.90-4.40)	8373
Total population (2005 - 2006)	1.29 (1.23-1.36)	1.27 (1.20-1.34)	2.01 (1.91-2.11)	3.05 (2.86-3.22)	3.91 (3.64-4.18)	8407
Total population (2007 - 2008)	1.27 (1.21-1.34)	1.22 (1.18-1.30)	1.90 (1.80-2.00)	2.80 (2.67-2.96)	3.70 (3.50-3.90)	8266
Total population (2009 - 2010)	1.12 (1.08-1.16)	1.07 (1.03-1.12)	1.70 (1.62-1.77)	2.58 (2.45-2.71)	3.34 (3.14-3.57)	8793
Age 1-5 years (1999 - 2000)	2.23 (1.96-2.53)	2.20 (1.90-2.50)	3.40 (2.80-3.90)	4.90 (4.00-6.60)	7.00 (6.10-8.30)	723
Age 1-5 years (2001 - 2002)	1.70 (1.55-1.87)	1.60 (1.50-1.80)	2.50 (2.20-2.90)	4.20 (3.50-5.20)	5.80 (4.70-6.90)	898
Age 1-5 years (2003 - 2004)	1.77 (1.60-1.95)	1.70 (1.50-1.90)	2.50 (2.30-2.80)	3.90 (3.30-4.60)	5.10 (4.10-6.60)	911
Age 1-5 years (2005 - 2006)	1.46 (1.36-1.57)	1.43 (1.34-1.55)	2.10 (1.97-2.20)	2.98 (2.72-3.32)	3.80 (3.49-4.54)	968
Age 1-5 years (2007 - 2008)	1.51 (1.37-1.66)	1.43 (1.30-1.60)	2.20 (1.98-2.31)	3.20 (2.65-3.85)	4.10 (3.40-5.19)	817
Age 1-5 years (2009 - 2010)	1.17 (1.08-1.26)	1.15 (1.03-1.27)	1.70 (1.50-1.87)	2.39 (2.08-2.65)	3.37 (2.63-4.11)	836
Age 6-11 years (1999 - 2000)	1.51 (1.36-1.66)	1.40 (1.30-1.60)	2.10 (1.80-2.50)	3.30 (2.80-3.80)	4.50 (3.40-6.20)	905
Age 6-11 years (2001 - 2002)	1.25 (1.14-1.36)	1.20 (1.00-1.30)	1.70 (1.60-2.00)	2.80 (2.50-3.10)	3.70 (3.00-4.70)	1044
Age 6-11 years (2003 - 2004)	1.25 (1.12-1.39)	1.20 (1.10-1.40)	1.80 (1.50-2.10)	2.60 (2.10-3.10)	3.30 (2.50-4.60)	856
Age 6-11 years (2005 - 2006)	1.02 (.948-1.10)	.970 (.890-1.01)	1.40 (1.28-1.55)	2.06 (1.80-2.72)	3.00 (2.26-3.81)	934
Age 6-11 years (2007 - 2008)	.988 (.914-1.07)	.960 (.880-1.07)	1.31 (1.22-1.49)	1.90 (1.70-2.11)	2.50 (2.10-2.88)	1011
Age 6-11 years (2009 - 2010)	.838 (.792-.887)	.810 (.740-.840)	1.13 (1.06-1.21)	1.64 (1.45-1.84)	2.01 (1.88-2.25)	1009
Age 12-19 years (1999 - 2000)	1.10 (1.04-1.17)	1.10 (1.00-1.20)	1.50 (1.40-1.70)	2.30 (2.10-2.40)	2.90 (2.70-3.00)	2135
Age 12-19 years (2001 - 2002)	.942 (.899-.986)	.900 (.900-1.00)	1.30 (1.20-1.40)	2.00 (1.90-2.10)	2.70 (2.40-2.90)	2231
Age 12-19 years (2003 - 2004)	.946 (.878-1.02)	.900 (.800-1.00)	1.30 (1.20-1.40)	1.90 (1.70-2.10)	2.60 (2.20-3.00)	2081
Age 12-19 years (2005 - 2006)	.797 (.746-.852)	.740 (.690-.790)	1.08 (.990-1.20)	1.69 (1.50-1.85)	2.23 (1.98-2.46)	1996
Age 12-19 years (2007 - 2008)	.800 (.744-.859)	.760 (.720-.820)	1.04 (.980-1.16)	1.50 (1.35-1.70)	1.90 (1.70-2.32)	1074
Age 12-19 years (2009 - 2010)	.680 (.636-.727)	.660 (.590-.700)	.910 (.840-.990)	1.29 (1.19-1.43)	1.72 (1.52-1.86)	1183
Age 20+ years (1999 - 2000)	1.75 (1.68-1.81)	1.70 (1.60-1.80)	2.60 (2.50-2.70)	3.90 (3.70-4.10)	5.20 (4.80-5.60)	4207
Age 20+ years (2001 - 2002)	1.56 (1.49-1.62)	1.60 (1.50-1.60)	2.30 (2.30-2.40)	3.60 (3.40-3.70)	4.60 (4.30-5.00)	4772
Age 20+ years (2003 - 2004)	1.52 (1.45-1.60)	1.50 (1.40-1.60)	2.30 (2.20-2.40)	3.30 (3.20-3.50)	4.30 (4.00-4.60)	4525
Age 20+ years (2005 - 2006)	1.41 (1.34-1.48)	1.41 (1.33-1.48)	2.17 (2.04-2.31)	3.22 (3.05-3.43)	4.12 (3.82-4.38)	4509
Age 20+ years (2007 - 2008)	1.38 (1.31-1.46)	1.34 (1.26-1.42)	2.06 (1.94-2.18)	3.00 (2.80-3.14)	3.90 (3.68-4.23)	5364
Age 20+ years (2009 - 2010)	1.23 (1.19-1.28)	1.20 (1.14-1.25)	1.85 (1.78-1.93)	2.77 (2.60-2.93)	3.57 (3.29-3.84)	5765

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.3, 0.3, 0.28, 0.25, 0.25, and 0.25 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Blood Lead (1999 – 2010)

CAS Number 7439-92-1

Geometric mean and selected percentiles of blood concentrations (in µg/dL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Males (1999 - 2000)	2.01 (1.93-2.09)	1.90 (1.90-2.00)	2.90 (2.80-3.00)	4.50 (4.10-4.80)	6.00 (5.50-6.50)	3913
Males (2001 - 2002)	1.78 (1.71-1.86)	1.80 (1.70-1.80)	2.70 (2.50-2.80)	3.90 (3.80-4.10)	5.40 (5.00-5.50)	4339
Males (2003 - 2004)	1.69 (1.62-1.75)	1.60 (1.50-1.70)	2.50 (2.40-2.60)	3.70 (3.40-3.90)	4.80 (4.50-5.20)	4132
Males (2005 - 2006)	1.52 (1.42-1.62)	1.49 (1.41-1.58)	2.30 (2.12-2.51)	3.48 (3.20-3.75)	4.36 (4.04-4.76)	4092
Males (2007 - 2008)	1.47 (1.39-1.56)	1.40 (1.32-1.50)	2.17 (2.00-2.30)	3.21 (3.01-3.53)	4.41 (4.10-4.88)	4147
Males (2009 - 2010)	1.31 (1.25-1.36)	1.26 (1.20-1.32)	1.96 (1.89-2.03)	2.93 (2.72-3.15)	3.84 (3.54-4.39)	4366
Females (1999 - 2000)	1.37 (1.32-1.43)	1.30 (1.30-1.40)	2.00 (1.90-2.10)	3.10 (2.90-3.30)	4.00 (3.80-4.20)	4057
Females (2001 - 2002)	1.19 (1.14-1.25)	1.20 (1.10-1.20)	1.80 (1.70-1.90)	2.60 (2.50-2.80)	3.60 (3.10-4.00)	4606
Females (2003 - 2004)	1.22 (1.14-1.31)	1.20 (1.10-1.30)	1.80 (1.70-2.00)	2.70 (2.50-3.00)	3.50 (3.10-3.80)	4241
Females (2005 - 2006)	1.11 (1.05-1.17)	1.06 (.980-1.15)	1.73 (1.61-1.84)	2.59 (2.44-2.74)	3.25 (3.12-3.44)	4315
Females (2007 - 2008)	1.11 (1.06-1.16)	1.09 (1.00-1.14)	1.64 (1.54-1.74)	2.41 (2.35-2.50)	3.00 (2.81-3.20)	4119
Females (2009 - 2010)	.966 (.929-1.01)	.940 (.890-.970)	1.43 (1.36-1.53)	2.18 (2.08-2.30)	2.81 (2.63-2.93)	4427
Mexican Americans (1999 - 2000)	1.83 (1.75-1.91)	1.80 (1.70-1.90)	2.80 (2.60-2.90)	4.20 (3.90-4.60)	5.80 (5.10-6.60)	2742
Mexican Americans (2001 - 2002)	1.46 (1.34-1.60)	1.50 (1.30-1.60)	2.30 (2.10-2.60)	3.60 (3.40-4.20)	5.40 (4.40-6.70)	2268
Mexican Americans (2003 - 2004)	1.55 (1.43-1.69)	1.50 (1.40-1.60)	2.30 (2.10-2.50)	3.50 (2.90-4.20)	4.90 (3.90-6.40)	2085
Mexican Americans (2005 - 2006)	1.29 (1.21-1.38)	1.26 (1.15-1.36)	2.00 (1.87-2.20)	3.16 (2.79-3.58)	4.22 (3.47-5.36)	2236
Mexican Americans (2007 - 2008)	1.25 (1.15-1.36)	1.20 (1.10-1.31)	1.88 (1.70-2.06)	2.81 (2.60-3.20)	3.92 (3.20-5.00)	1712
Mexican Americans (2009 - 2010)	1.14 (1.03-1.28)	1.04 (.940-1.18)	1.76 (1.52-1.99)	2.93 (2.63-3.30)	3.92 (3.60-4.69)	1966
Non-Hispanic blacks (1999 - 2000)	1.87 (1.75-2.00)	1.80 (1.70-2.00)	2.80 (2.60-3.00)	4.30 (4.00-4.60)	5.70 (5.20-6.10)	1842
Non-Hispanic blacks (2001 - 2002)	1.65 (1.52-1.80)	1.60 (1.40-1.70)	2.60 (2.30-2.90)	4.20 (3.80-4.70)	5.80 (5.30-6.50)	2219
Non-Hispanic blacks (2003 - 2004)	1.69 (1.52-1.89)	1.60 (1.40-1.80)	2.60 (2.20-3.00)	4.10 (3.50-4.70)	5.30 (4.60-6.60)	2293
Non-Hispanic blacks (2005 - 2006)	1.39 (1.26-1.53)	1.31 (1.19-1.45)	2.16 (1.95-2.42)	3.48 (3.19-3.80)	4.65 (4.21-5.14)	2193
Non-Hispanic blacks (2007 - 2008)	1.39 (1.30-1.48)	1.30 (1.20-1.42)	2.10 (2.00-2.20)	3.22 (3.08-3.50)	4.50 (4.00-4.80)	1746
Non-Hispanic blacks (2009 - 2010)	1.24 (1.18-1.30)	1.19 (1.12-1.25)	1.87 (1.76-1.99)	2.90 (2.68-3.18)	3.86 (3.57-4.29)	1593
Non-Hispanic whites (1999 - 2000)	1.62 (1.55-1.69)	1.60 (1.50-1.70)	2.40 (2.30-2.50)	3.60 (3.40-3.90)	5.00 (4.40-5.70)	2716
Non-Hispanic whites (2001 - 2002)	1.43 (1.37-1.48)	1.40 (1.30-1.50)	2.20 (2.10-2.20)	3.20 (3.10-3.40)	4.20 (3.90-4.50)	3806
Non-Hispanic whites (2003 - 2004)	1.37 (1.32-1.43)	1.30 (1.30-1.40)	2.10 (2.00-2.10)	3.00 (2.80-3.20)	3.90 (3.60-4.30)	3478
Non-Hispanic whites (2005 - 2006)	1.28 (1.19-1.37)	1.27 (1.17-1.38)	1.97 (1.86-2.14)	2.99 (2.73-3.25)	3.82 (3.41-4.20)	3310
Non-Hispanic whites (2007 - 2008)	1.24 (1.16-1.33)	1.20 (1.10-1.30)	1.86 (1.72-2.00)	2.70 (2.54-2.90)	3.50 (3.20-3.89)	3461
Non-Hispanic whites (2009 - 2010)	1.10 (1.04-1.16)	1.07 (1.00-1.15)	1.67 (1.59-1.76)	2.49 (2.35-2.63)	3.14 (2.99-3.36)	3760

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.3, 0.3, 0.28, 0.25, 0.25, and 0.25 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Blood Lead (2011 – 2016)

CAS Number 7439-92-1

Geometric mean and selected percentiles of blood concentrations (in µg/dL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.973 (.916-1.04)	.930 (.880-.980)	1.52 (1.41-1.61)	2.38 (2.17-2.61)	3.16 (2.77-3.68)	7920
Total population (2013 - 2014)	.858 (.813-.906)	.830 (.780-.870)	1.32 (1.24-1.42)	2.10 (1.96-2.30)	2.81 (2.49-3.14)	5215
Total population (2015 - 2016)	.820 (.772-.872)	.780 (.740-.840)	1.32 (1.21-1.42)	2.14 (2.02-2.24)	2.75 (2.50-2.98)	4988
Age 1-5 years (2011 - 2012)	.970 (.877-1.07)	.950 (.870-1.04)	1.34 (1.20-1.65)	2.26 (1.88-2.65)	2.91 (2.41-3.83)	713
Age 1-5 years (2013 - 2014)	.782 (.705-.869)	.740 (.680-.800)	1.08 (.940-1.24)	1.58 (1.33-1.90)	2.24 (1.68-2.64)	818
Age 1-5 years (2015 - 2016)	.758 (.675-.850)	.690 (.610-.790)	1.10 (.950-1.32)	1.86 (1.50-2.65)	2.76 (1.94-3.81)	790
Age 6-11 years (2011 - 2012)	.681 (.623-.744)	.640 (.600-.700)	.930 (.820-1.05)	1.34 (1.14-1.60)	1.89 (1.36-2.94)	1048
Age 6-11 years (2013 - 2014)	.567 (.529-.607)	.530 (.500-.570)	.760 (.700-.820)	1.13 (1.01-1.23)	1.42 (1.21-1.83)	1075
Age 6-11 years (2015 - 2016)	.571 (.523-.623)	.550 (.510-.600)	.780 (.720-.830)	1.18 (.970-1.44)	1.59 (1.24-2.24)	1023
Age 12-19 years (2011 - 2012)	.554 (.511-.601)	.530 (.490-.570)	.740 (.660-.830)	1.09 (.960-1.19)	1.31 (1.16-1.65)	1129
Age 12-19 years (2013 - 2014)	.506 (.464-.551)	.460 (.420-.500)	.670 (.600-.750)	1.13 (.870-1.53)	1.69 (1.27-2.06)	627
Age 12-19 years (2015 - 2016)	.467 (.433-.504)	.450 (.410-.490)	.680 (.610-.730)	.930 (.820-1.03)	1.17 (.990-1.36)	565
Age 20+ years (2011 - 2012)	1.09 (1.03-1.16)	1.05 (1.00-1.12)	1.67 (1.56-1.79)	2.56 (2.33-2.77)	3.36 (2.98-3.93)	5030
Age 20+ years (2013 - 2014)	.967 (.921-1.02)	.940 (.900-.980)	1.45 (1.37-1.55)	2.26 (2.09-2.49)	3.03 (2.65-3.55)	2695
Age 20+ years (2015 - 2016)	.920 (.862-.982)	.880 (.810-.960)	1.46 (1.35-1.59)	2.30 (2.15-2.44)	2.89 (2.65-3.07)	2610
Males (2011 - 2012)	1.13 (1.06-1.21)	1.07 (1.01-1.14)	1.74 (1.63-1.88)	2.73 (2.48-3.01)	3.68 (3.18-4.22)	3968
Males (2013 - 2014)	.994 (.919-1.08)	.940 (.890-1.00)	1.48 (1.35-1.61)	2.41 (2.07-2.90)	3.47 (2.89-4.32)	2587
Males (2015 - 2016)	.921 (.864-.981)	.860 (.800-.930)	1.46 (1.33-1.60)	2.41 (2.18-2.62)	2.93 (2.75-3.26)	2488
Females (2011 - 2012)	.842 (.796-.890)	.820 (.780-.860)	1.30 (1.22-1.39)	1.98 (1.83-2.22)	2.59 (2.32-2.94)	3952
Females (2013 - 2014)	.746 (.715-.777)	.730 (.700-.760)	1.19 (1.11-1.28)	1.86 (1.69-2.02)	2.33 (2.24-2.42)	2628
Females (2015 - 2016)	.735 (.679-.795)	.720 (.650-.770)	1.16 (1.04-1.31)	1.88 (1.66-2.13)	2.39 (2.21-2.65)	2500
Mexican Americans (2011 - 2012)	.838 (.767-.916)	.780 (.690-.880)	1.27 (1.15-1.40)	2.05 (1.81-2.36)	3.06 (2.34-3.59)	1077
Mexican Americans (2013 - 2014)	.746 (.685-.813)	.690 (.650-.750)	1.17 (1.10-1.28)	1.88 (1.61-2.04)	2.38 (2.03-2.74)	969
Mexican Americans (2015 - 2016)	.704 (.659-.752)	.680 (.610-.730)	1.10 (.970-1.22)	1.77 (1.67-1.96)	2.39 (2.01-3.10)	994
Non-Hispanic blacks (2011 - 2012)	.998 (.947-1.05)	.910 (.850-.990)	1.53 (1.45-1.60)	2.58 (2.31-2.91)	3.72 (3.04-4.58)	2195
Non-Hispanic blacks (2013 - 2014)	.871 (.787-.963)	.830 (.720-.940)	1.39 (1.27-1.48)	2.17 (2.00-2.38)	3.03 (2.48-4.00)	1119
Non-Hispanic blacks (2015 - 2016)	.856 (.763-.962)	.790 (.700-.890)	1.32 (1.11-1.60)	2.19 (1.86-2.80)	3.11 (2.76-3.39)	1070
Non-Hispanic whites (2011 - 2012)	.993 (.914-1.08)	.960 (.880-1.03)	1.56 (1.40-1.73)	2.43 (2.11-2.74)	3.14 (2.67-3.85)	2493
Non-Hispanic whites (2013 - 2014)	.882 (.820-.950)	.870 (.800-.920)	1.34 (1.24-1.48)	2.20 (1.94-2.48)	2.97 (2.43-3.58)	1848
Non-Hispanic whites (2015 - 2016)	.835 (.774-.900)	.790 (.750-.860)	1.35 (1.23-1.49)	2.21 (2.03-2.36)	2.72 (2.39-2.98)	1511
All Hispanics (2011 - 2012)	.855 (.793-.922)	.820 (.750-.880)	1.27 (1.18-1.39)	2.00 (1.86-2.23)	2.84 (2.41-3.34)	1931
All Hispanics (2013 - 2014)	.742 (.695-.793)	.690 (.660-.730)	1.14 (1.08-1.24)	1.80 (1.62-1.99)	2.36 (2.03-2.72)	1481
All Hispanics (2015 - 2016)	.703 (.658-.750)	.670 (.620-.720)	1.10 (1.01-1.18)	1.73 (1.56-2.00)	2.39 (2.00-2.97)	1664
Asians (2011 - 2012)	1.15 (1.06-1.24)	1.14 (1.02-1.26)	1.70 (1.56-1.86)	2.56 (2.36-2.72)	3.28 (2.80-3.65)	1005
Asians (2013 - 2014)	1.01 (.923-1.11)	1.02 (.900-1.19)	1.48 (1.35-1.66)	2.25 (2.06-2.39)	2.67 (2.37-2.86)	510
Asians (2015 - 2016)	1.07 (.976-1.18)	1.08 (.920-1.20)	1.65 (1.47-1.96)	2.62 (2.11-2.92)	3.07 (2.76-3.49)	479

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.25, 0.07, and 0.07 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Urinary Lead (1999 – 2010)

CAS Number 7439-92-1

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.766 (.708-.828)	.800 (.800-.900)	1.40 (1.30-1.50)	2.20 (2.00-2.30)	2.90 (2.60-3.30)	2465
Total population (2001 - 2002)	.677 (.637-.718)	.700 (.700-.800)	1.20 (1.20-1.30)	2.00 (1.90-2.20)	2.70 (2.50-2.80)	2690
Total population (2003 - 2004)	.636 (.595-.680)	.640 (.580-.690)	1.04 (.960-1.12)	1.73 (1.52-1.86)	2.29 (2.03-2.62)	2558
Total population (2005 - 2006)	.554 (.523-.587)	.570 (.540-.600)	.990 (.910-1.05)	1.58 (1.44-1.73)	2.14 (1.94-2.45)	2576
Total population (2007 - 2008)	.493 (.467-.520)	.500 (.470-.530)	.850 (.790-.910)	1.38 (1.23-1.58)	1.97 (1.75-2.17)	2627
Total population (2009 - 2010)	.458 (.441-.476)	.470 (.450-.480)	.790 (.750-.830)	1.24 (1.11-1.38)	1.65 (1.46-1.84)	2848
Age 6-11 years (1999 - 2000)	1.07 (.955-1.20)	1.10 (.900-1.30)	1.50 (1.40-1.70)	2.40 (1.80-3.10)	3.40 (2.40-5.00)	340
Age 6-11 years (2001 - 2002)	.753 (.661-.857)	.800 (.600-.900)	1.20 (1.10-1.40)	2.10 (1.60-2.40)	2.60 (2.10-3.70)	368
Age 6-11 years (2003 - 2004)	.795 (.671-.941)	.790 (.640-.900)	1.35 (.970-1.86)	2.27 (1.62-4.09)	3.33 (2.23-4.41)	290
Age 6-11 years (2005 - 2006)	.508 (.447-.579)	.510 (.440-.560)	.740 (.620-.980)	1.33 (1.00-1.86)	1.90 (1.33-2.60)	355
Age 6-11 years (2007 - 2008)	.494 (.411-.593)	.520 (.410-.590)	.790 (.660-.900)	1.23 (.980-1.73)	1.90 (1.51-2.18)	394
Age 6-11 years (2009 - 2010)	.443 (.399-.493)	.460 (.430-.490)	.710 (.630-.820)	1.09 (.880-1.33)	1.40 (1.06-1.82)	378
Age 12-19 years (1999 - 2000)	.659 (.579-.749)	.700 (.600-.800)	1.10 (.900-1.30)	1.80 (1.40-2.20)	2.20 (1.90-2.80)	719
Age 12-19 years (2001 - 2002)	.564 (.526-.605)	.600 (.500-.600)	1.00 (.800-1.10)	1.60 (1.40-1.70)	2.00 (1.80-2.40)	762
Age 12-19 years (2003 - 2004)	.604 (.553-.660)	.630 (.570-.680)	.920 (.810-1.02)	1.32 (1.14-1.80)	1.86 (1.44-2.29)	725
Age 12-19 years (2005 - 2006)	.472 (.421-.530)	.490 (.450-.540)	.780 (.710-.830)	1.19 (1.10-1.45)	1.65 (1.34-1.80)	701
Age 12-19 years (2007 - 2008)	.386 (.346-.431)	.380 (.350-.410)	.640 (.560-.720)	1.03 (.870-1.24)	1.38 (1.09-1.91)	376
Age 12-19 years (2009 - 2010)	.320 (.283-.361)	.320 (.270-.370)	.530 (.460-.630)	.830 (.710-1.10)	1.16 (.860-1.37)	451
Age 20+ years (1999 - 2000)	.752 (.691-.818)	.800 (.700-.900)	1.40 (1.30-1.50)	2.20 (2.00-2.40)	2.90 (2.60-3.30)	1406
Age 20+ years (2001 - 2002)	.688 (.641-.738)	.700 (.700-.800)	1.20 (1.20-1.30)	2.00 (1.90-2.30)	2.80 (2.50-2.90)	1560
Age 20+ years (2003 - 2004)	.625 (.579-.674)	.620 (.560-.700)	1.04 (.960-1.11)	1.70 (1.52-1.80)	2.21 (2.04-2.49)	1543
Age 20+ years (2005 - 2006)	.574 (.539-.612)	.600 (.560-.640)	1.02 (.970-1.13)	1.65 (1.53-1.81)	2.21 (1.99-2.57)	1520
Age 20+ years (2007 - 2008)	.512 (.485-.540)	.530 (.490-.560)	.900 (.820-.950)	1.49 (1.29-1.64)	2.01 (1.78-2.33)	1857
Age 20+ years (2009 - 2010)	.486 (.465-.507)	.490 (.470-.520)	.830 (.780-.880)	1.32 (1.16-1.46)	1.71 (1.52-2.03)	2019
Males (1999 - 2000)	.923 (.822-1.04)	.900 (.900-1.00)	1.60 (1.40-1.80)	2.50 (2.20-2.90)	3.40 (2.90-3.80)	1227
Males (2001 - 2002)	.808 (.757-.862)	.800 (.800-.900)	1.40 (1.30-1.50)	2.50 (2.20-2.70)	3.20 (2.90-3.50)	1335
Males (2003 - 2004)	.731 (.680-.785)	.730 (.680-.800)	1.17 (1.07-1.27)	2.03 (1.78-2.22)	2.66 (2.33-2.91)	1281
Males (2005 - 2006)	.672 (.638-.707)	.690 (.620-.760)	1.16 (1.04-1.28)	1.78 (1.60-2.00)	2.45 (2.00-2.97)	1271
Males (2007 - 2008)	.560 (.518-.606)	.570 (.530-.620)	.930 (.840-1.02)	1.63 (1.36-1.97)	2.30 (1.97-3.07)	1327
Males (2009 - 2010)	.527 (.491-.566)	.540 (.480-.580)	.880 (.820-.960)	1.41 (1.25-1.58)	1.83 (1.62-2.21)	1398
Females (1999 - 2000)	.642 (.589-.701)	.700 (.600-.800)	1.20 (1.10-1.30)	1.90 (1.60-2.20)	2.40 (2.10-3.00)	1238
Females (2001 - 2002)	.573 (.535-.613)	.600 (.600-.600)	1.10 (1.00-1.10)	1.60 (1.50-1.80)	2.20 (1.90-2.40)	1355
Females (2003 - 2004)	.558 (.506-.616)	.540 (.480-.620)	.920 (.820-1.04)	1.49 (1.24-1.75)	1.82 (1.59-2.30)	1277
Females (2005 - 2006)	.461 (.425-.499)	.460 (.430-.510)	.810 (.730-.880)	1.27 (1.17-1.46)	1.86 (1.54-2.17)	1305
Females (2007 - 2008)	.436 (.412-.461)	.430 (.400-.480)	.760 (.690-.830)	1.22 (1.05-1.34)	1.67 (1.44-1.81)	1300
Females (2009 - 2010)	.400 (.378-.424)	.420 (.390-.440)	.690 (.660-.740)	1.05 (.990-1.13)	1.42 (1.26-1.59)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.1, 0.33, 0.1, 0.1, and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Urinary Lead (1999 – 2010)

CAS Number 7439-92-1

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	1.02 (.915-1.13)	1.10 (.900-1.20)	1.80 (1.60-1.90)	2.90 (2.50-3.40)	4.30 (3.10-5.40)	884
Mexican Americans (2001 - 2002)	.833 (.745-.931)	.900 (.700-1.00)	1.50 (1.20-1.70)	2.50 (2.00-2.90)	3.30 (2.70-3.80)	683
Mexican Americans (2003 - 2004)	.815 (.710-.935)	.840 (.700-.990)	1.31 (1.18-1.59)	2.19 (1.86-2.50)	2.66 (2.13-3.97)	618
Mexican Americans (2005 - 2006)	.729 (.653-.815)	.770 (.680-.860)	1.32 (1.15-1.59)	2.22 (1.81-2.64)	3.08 (2.50-4.03)	652
Mexican Americans (2007 - 2008)	.607 (.528-.698)	.610 (.530-.690)	.990 (.890-1.21)	1.76 (1.37-2.17)	2.29 (1.82-2.80)	515
Mexican Americans (2009 - 2010)	.546 (.483-.618)	.520 (.460-.580)	.930 (.800-1.09)	1.66 (1.34-1.89)	2.16 (1.80-2.87)	613
Non-Hispanic blacks (1999 - 2000)	1.11 (1.00-1.23)	1.10 (1.00-1.20)	1.90 (1.50-2.10)	3.00 (2.40-3.50)	4.20 (3.30-5.70)	568
Non-Hispanic blacks (2001 - 2002)	.940 (.833-1.06)	.900 (.800-1.00)	1.60 (1.30-1.80)	2.70 (2.10-3.40)	3.70 (2.90-4.80)	667
Non-Hispanic blacks (2003 - 2004)	.848 (.729-.986)	.850 (.710-1.00)	1.40 (1.10-1.72)	2.14 (1.78-2.64)	2.82 (2.31-3.89)	723
Non-Hispanic blacks (2005 - 2006)	.666 (.604-.734)	.660 (.590-.760)	1.09 (.980-1.18)	1.62 (1.42-1.85)	2.24 (1.65-2.90)	692
Non-Hispanic blacks (2007 - 2008)	.618 (.558-.685)	.620 (.560-.690)	1.01 (.920-1.13)	1.56 (1.38-1.90)	2.06 (1.88-2.60)	589
Non-Hispanic blacks (2009 - 2010)	.560 (.522-.601)	.550 (.490-.600)	.910 (.830-1.01)	1.53 (1.26-1.71)	1.96 (1.68-2.80)	544
Non-Hispanic whites (1999 - 2000)	.695 (.625-.773)	.700 (.700-.900)	1.30 (1.10-1.40)	2.00 (1.80-2.40)	2.70 (2.30-3.10)	822
Non-Hispanic whites (2001 - 2002)	.610 (.572-.651)	.700 (.600-.700)	1.10 (1.10-1.20)	1.90 (1.70-2.00)	2.40 (2.30-2.60)	1132
Non-Hispanic whites (2003 - 2004)	.591 (.556-.628)	.590 (.540-.650)	.960 (.910-.990)	1.52 (1.40-1.75)	2.14 (1.78-2.51)	1074
Non-Hispanic whites (2005 - 2006)	.520 (.477-.566)	.540 (.490-.580)	.950 (.820-1.05)	1.53 (1.30-1.76)	2.07 (1.78-2.45)	1041
Non-Hispanic whites (2007 - 2008)	.452 (.422-.485)	.460 (.430-.490)	.780 (.700-.880)	1.23 (1.03-1.50)	1.79 (1.58-1.97)	1095
Non-Hispanic whites (2009 - 2010)	.431 (.406-.458)	.450 (.410-.480)	.750 (.690-.820)	1.11 (1.05-1.24)	1.51 (1.39-1.67)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.1, 0.33, 0.1, 0.1, and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Urinary Lead (2011 – 2016)

CAS Number 7439-92-1

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.360 (.328-.396)	.370 (.340-.400)	.650 (.580-.720)	1.05 (.980-1.17)	1.49 (1.26-1.75)	2504
Total population (2013 - 2014)	.277 (.257-.298)	.290 (.270-.300)	.500 (.480-.530)	.840 (.780-.900)	1.17 (1.01-1.41)	2664
Total population (2015 - 2016)	.284 (.261-.308)	.290 (.260-.320)	.520 (.470-.570)	.960 (.860-1.02)	1.26 (1.13-1.44)	3061
Age 3-5 years (2015 - 2016)	.257 (.225-.292)	.230 (.210-.270)	.460 (.370-.560)	.870 (.710-1.09)	1.20 (.920-1.48)	486
Age 6-11 years (2011 - 2012)	.346 (.292-.410)	.370 (.300-.440)	.610 (.540-.770)	1.12 (.830-1.51)	1.54 (1.28-1.85)	399
Age 6-11 years (2013 - 2014)	.222 (.192-.258)	.240 (.200-.270)	.390 (.330-.450)	.630 (.560-.810)	.870 (.710-1.09)	402
Age 6-11 years (2015 - 2016)	.257 (.238-.276)	.250 (.230-.270)	.410 (.360-.480)	.680 (.580-.790)	.870 (.730-1.36)	379
Age 12-19 years (2011 - 2012)	.259 (.219-.305)	.260 (.220-.340)	.470 (.380-.530)	.720 (.540-.900)	.970 (.720-1.17)	390
Age 12-19 years (2013 - 2014)	.201 (.166-.245)	.220 (.190-.260)	.360 (.290-.440)	.550 (.450-.700)	.750 (.570-.880)	451
Age 12-19 years (2015 - 2016)	.196 (.183-.211)	.200 (.180-.220)	.340 (.300-.360)	.530 (.440-.650)	.730 (.580-1.12)	402
Age 20+ years (2011 - 2012)	.381 (.348-.416)	.390 (.360-.420)	.680 (.640-.730)	1.11 (1.01-1.21)	1.58 (1.28-1.90)	1715
Age 20+ years (2013 - 2014)	.297 (.280-.315)	.300 (.290-.320)	.540 (.510-.580)	.900 (.820-.980)	1.27 (1.08-1.55)	1811
Age 20+ years (2015 - 2016)	.304 (.276-.334)	.320 (.270-.360)	.570 (.510-.630)	1.01 (.950-1.08)	1.38 (1.18-1.51)	1794
Males (2011 - 2012)	.414 (.367-.466)	.420 (.380-.460)	.730 (.640-.800)	1.16 (.990-1.47)	1.73 (1.33-2.18)	1262
Males (2013 - 2014)	.315 (.295-.337)	.320 (.290-.340)	.580 (.520-.620)	.940 (.840-1.08)	1.48 (1.15-1.92)	1318
Males (2015 - 2016)	.313 (.285-.343)	.330 (.280-.380)	.590 (.540-.650)	1.02 (.900-1.08)	1.26 (1.11-1.49)	1524
Females (2011 - 2012)	.316 (.282-.355)	.320 (.290-.360)	.580 (.500-.660)	.970 (.830-1.14)	1.31 (1.15-1.41)	1242
Females (2013 - 2014)	.245 (.222-.269)	.260 (.240-.280)	.460 (.430-.480)	.720 (.670-.790)	1.00 (.870-1.16)	1346
Females (2015 - 2016)	.259 (.233-.288)	.260 (.230-.290)	.450 (.400-.530)	.880 (.730-.990)	1.26 (1.00-1.45)	1537
Mexican Americans (2011 - 2012)	.372 (.320-.431)	.380 (.320-.480)	.670 (.550-.780)	1.17 (.820-1.58)	1.67 (1.17-2.18)	317
Mexican Americans (2013 - 2014)	.277 (.240-.319)	.290 (.250-.320)	.480 (.440-.580)	.890 (.690-1.15)	1.21 (.930-1.97)	453
Mexican Americans (2015 - 2016)	.295 (.260-.335)	.290 (.260-.350)	.550 (.460-.590)	.960 (.810-1.16)	1.33 (1.10-1.99)	585
Non-Hispanic blacks (2011 - 2012)	.431 (.385-.483)	.440 (.370-.520)	.730 (.660-.830)	1.15 (1.00-1.39)	1.64 (1.39-1.87)	669
Non-Hispanic blacks (2013 - 2014)	.371 (.320-.429)	.380 (.310-.440)	.620 (.530-.730)	1.09 (.830-1.34)	1.45 (1.24-1.72)	581
Non-Hispanic blacks (2015 - 2016)	.340 (.298-.388)	.340 (.300-.380)	.620 (.490-.720)	1.01 (.820-1.19)	1.38 (1.09-1.65)	671
Non-Hispanic whites (2011 - 2012)	.346 (.311-.385)	.360 (.330-.390)	.610 (.540-.700)	1.02 (.920-1.16)	1.38 (1.14-1.85)	820
Non-Hispanic whites (2013 - 2014)	.267 (.245-.290)	.280 (.260-.300)	.500 (.450-.540)	.820 (.730-.920)	1.16 (.950-1.60)	985
Non-Hispanic whites (2015 - 2016)	.275 (.247-.305)	.270 (.230-.330)	.500 (.450-.570)	.930 (.790-1.03)	1.29 (1.08-1.52)	924
All Hispanics (2011 - 2012)	.372 (.327-.423)	.370 (.320-.420)	.670 (.590-.750)	1.15 (.950-1.31)	1.51 (1.18-2.13)	573
All Hispanics (2013 - 2014)	.270 (.239-.305)	.280 (.240-.320)	.480 (.440-.540)	.820 (.690-.930)	1.17 (.940-1.47)	701
All Hispanics (2015 - 2016)	.284 (.258-.312)	.280 (.260-.310)	.530 (.480-.560)	.930 (.850-1.04)	1.31 (1.18-1.50)	982
Asians (2011 - 2012)	.383 (.341-.429)	.380 (.350-.460)	.690 (.620-.790)	1.15 (.950-1.32)	1.38 (1.21-1.72)	353
Asians (2013 - 2014)	.257 (.230-.287)	.290 (.240-.350)	.470 (.410-.510)	.710 (.560-.790)	.890 (.750-.980)	292
Asians (2015 - 2016)	.292 (.264-.324)	.300 (.250-.360)	.570 (.460-.660)	.980 (.710-1.14)	1.14 (1.01-1.21)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.08, 0.03, and 0.03, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Urinary Lead (creatinine corrected) (1999 – 2010)

CAS Number 7439-92-1

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.721 (.700-.742)	.701 (.677-.725)	1.11 (1.05-1.15)	1.70 (1.62-1.85)	2.38 (2.22-2.79)	2465
Total population (2001 - 2002)	.639 (.603-.677)	.635 (.588-.676)	1.03 (.963-1.08)	1.52 (1.43-1.61)	2.03 (1.89-2.22)	2689
Total population (2003 - 2004)	.632 (.603-.662)	.622 (.594-.655)	.979 (.920-1.03)	1.49 (1.33-1.64)	1.97 (1.73-2.26)	2558
Total population (2005 - 2006)	.546 (.520-.573)	.530 (.510-.560)	.860 (.810-.900)	1.27 (1.15-1.37)	1.71 (1.50-1.89)	2576
Total population (2007 - 2008)	.514 (.482-.548)	.500 (.460-.530)	.800 (.720-.880)	1.30 (1.23-1.42)	1.85 (1.73-1.96)	2627
Total population (2009 - 2010)	.488 (.466-.512)	.470 (.440-.500)	.760 (.710-.810)	1.16 (1.08-1.28)	1.53 (1.41-1.62)	2848
Age 6-11 years (1999 - 2000)	1.17 (.975-1.41)	1.06 (.918-1.22)	1.55 (1.22-1.97)	2.71 (1.67-4.66)	4.66 (1.97-18.0)	340
Age 6-11 years (2001 - 2002)	.918 (.841-1.00)	.870 (.800-.933)	1.27 (1.12-1.43)	2.33 (1.59-3.64)	3.64 (1.89-5.56)	368
Age 6-11 years (2003 - 2004)	.926 (.812-1.06)	.914 (.781-1.03)	1.45 (1.17-1.72)	2.14 (1.62-3.47)	3.47 (2.19-5.31)	290
Age 6-11 years (2005 - 2006)	.628 (.563-.701)	.590 (.530-.680)	.870 (.770-.940)	1.29 (1.03-1.82)	1.96 (1.32-2.42)	355
Age 6-11 years (2007 - 2008)	.643 (.543-.763)	.630 (.530-.730)	1.02 (.770-1.24)	1.50 (1.24-2.02)	2.04 (1.70-2.58)	394
Age 6-11 years (2009 - 2010)	.604 (.551-.662)	.580 (.520-.650)	.870 (.780-1.00)	1.32 (1.09-1.51)	1.60 (1.38-1.75)	378
Age 12-19 years (1999 - 2000)	.496 (.460-.535)	.469 (.408-.508)	.709 (.655-.828)	1.11 (.981-1.28)	1.65 (1.15-2.79)	719
Age 12-19 years (2001 - 2002)	.404 (.380-.428)	.375 (.342-.400)	.603 (.541-.702)	.990 (.882-1.18)	1.41 (1.07-1.63)	762
Age 12-19 years (2003 - 2004)	.432 (.404-.461)	.404 (.383-.436)	.623 (.551-.730)	.938 (.828-1.06)	1.23 (1.09-1.35)	725
Age 12-19 years (2005 - 2006)	.363 (.333-.395)	.340 (.310-.360)	.510 (.460-.600)	.800 (.690-.930)	1.07 (.940-1.23)	701
Age 12-19 years (2007 - 2008)	.302 (.270-.337)	.290 (.250-.340)	.430 (.400-.490)	.670 (.550-.790)	.900 (.700-1.09)	376
Age 12-19 years (2009 - 2010)	.299 (.273-.328)	.290 (.260-.320)	.420 (.370-.490)	.620 (.550-.760)	.880 (.740-1.01)	451
Age 20+ years (1999 - 2000)	.720 (.683-.758)	.712 (.667-.739)	1.10 (1.02-1.18)	1.69 (1.53-1.87)	2.31 (2.15-2.62)	1406
Age 20+ years (2001 - 2002)	.658 (.617-.703)	.652 (.608-.702)	1.05 (.992-1.11)	1.51 (1.40-1.61)	2.00 (1.85-2.19)	1559
Age 20+ years (2003 - 2004)	.641 (.606-.679)	.633 (.605-.670)	.988 (.917-1.04)	1.47 (1.28-1.63)	1.94 (1.72-2.12)	1543
Age 20+ years (2005 - 2006)	.573 (.548-.600)	.570 (.530-.600)	.890 (.850-.960)	1.32 (1.22-1.41)	1.77 (1.53-1.94)	1520
Age 20+ years (2007 - 2008)	.545 (.513-.579)	.530 (.490-.570)	.840 (.760-.910)	1.36 (1.27-1.49)	1.92 (1.78-2.08)	1857
Age 20+ years (2009 - 2010)	.514 (.489-.539)	.500 (.460-.530)	.790 (.730-.840)	1.22 (1.10-1.35)	1.57 (1.46-1.71)	2019
Males (1999 - 2000)	.720 (.679-.763)	.693 (.645-.734)	1.10 (.992-1.22)	1.68 (1.50-2.09)	2.43 (2.15-3.03)	1227
Males (2001 - 2002)	.639 (.607-.673)	.638 (.586-.686)	1.01 (.957-1.08)	1.55 (1.41-1.61)	2.06 (1.88-2.43)	1334
Males (2003 - 2004)	.615 (.588-.644)	.593 (.561-.639)	.914 (.862-.977)	1.44 (1.25-1.53)	2.00 (1.71-2.28)	1281
Males (2005 - 2006)	.551 (.522-.582)	.530 (.510-.580)	.830 (.770-.910)	1.25 (1.13-1.39)	1.77 (1.42-2.20)	1271
Males (2007 - 2008)	.501 (.471-.534)	.490 (.450-.530)	.750 (.700-.810)	1.29 (1.15-1.49)	1.88 (1.71-1.98)	1327
Males (2009 - 2010)	.481 (.458-.505)	.450 (.430-.490)	.740 (.690-.800)	1.15 (1.04-1.29)	1.56 (1.37-1.70)	1398
Females (1999 - 2000)	.722 (.681-.765)	.707 (.667-.746)	1.11 (1.05-1.18)	1.74 (1.50-2.02)	2.38 (2.03-2.88)	1238
Females (2001 - 2002)	.639 (.594-.688)	.625 (.571-.682)	1.03 (.946-1.11)	1.50 (1.39-1.61)	1.98 (1.85-2.15)	1355
Females (2003 - 2004)	.648 (.601-.698)	.649 (.604-.718)	1.03 (.938-1.10)	1.56 (1.34-1.73)	1.96 (1.72-2.20)	1277
Females (2005 - 2006)	.541 (.507-.577)	.530 (.500-.580)	.880 (.820-.940)	1.28 (1.12-1.41)	1.64 (1.38-1.91)	1305
Females (2007 - 2008)	.527 (.489-.568)	.500 (.470-.550)	.840 (.740-.960)	1.34 (1.23-1.47)	1.79 (1.56-2.08)	1300
Females (2009 - 2010)	.495 (.466-.526)	.480 (.450-.520)	.780 (.710-.830)	1.20 (1.08-1.32)	1.52 (1.39-1.62)	1450

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Urinary Lead (creatinine corrected) (1999 – 2010)

CAS Number 7439-92-1

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.940 (.876-1.01)	.887 (.796-1.03)	1.43 (1.37-1.58)	2.38 (2.08-2.77)	3.46 (2.78-4.18)	884
Mexican Americans (2001 - 2002)	.810 (.731-.898)	.774 (.702-.893)	1.29 (1.09-1.44)	2.05 (1.75-2.50)	2.78 (2.56-3.33)	682
Mexican Americans (2003 - 2004)	.755 (.681-.838)	.708 (.612-.851)	1.18 (1.09-1.31)	1.86 (1.50-2.26)	2.31 (1.98-2.92)	618
Mexican Americans (2005 - 2006)	.686 (.638-.737)	.680 (.620-.740)	1.00 (.930-1.13)	1.63 (1.39-1.88)	2.20 (1.77-3.20)	652
Mexican Americans (2007 - 2008)	.607 (.514-.717)	.590 (.500-.690)	.970 (.770-1.19)	1.56 (1.25-2.07)	2.20 (1.78-2.46)	515
Mexican Americans (2009 - 2010)	.573 (.526-.623)	.540 (.470-.610)	.950 (.780-1.06)	1.59 (1.41-1.82)	2.02 (1.82-2.40)	613
Non-Hispanic blacks (1999 - 2000)	.722 (.659-.790)	.671 (.583-.753)	1.11 (.988-1.20)	2.00 (1.56-2.51)	2.83 (2.20-3.88)	568
Non-Hispanic blacks (2001 - 2002)	.644 (.559-.742)	.608 (.510-.710)	.962 (.853-1.20)	1.79 (1.36-2.33)	2.75 (2.04-3.98)	667
Non-Hispanic blacks (2003 - 2004)	.609 (.529-.701)	.569 (.492-.698)	.900 (.793-1.03)	1.48 (1.11-1.97)	2.24 (1.65-2.88)	723
Non-Hispanic blacks (2005 - 2006)	.483 (.459-.508)	.470 (.440-.490)	.740 (.670-.820)	1.18 (1.06-1.29)	1.60 (1.37-1.85)	692
Non-Hispanic blacks (2007 - 2008)	.452 (.414-.492)	.440 (.400-.490)	.710 (.610-.780)	1.13 (.930-1.33)	1.57 (1.21-1.88)	589
Non-Hispanic blacks (2009 - 2010)	.444 (.417-.473)	.420 (.390-.470)	.680 (.600-.740)	1.07 (.940-1.18)	1.51 (1.18-1.65)	544
Non-Hispanic whites (1999 - 2000)	.696 (.668-.725)	.677 (.645-.718)	1.07 (.997-1.14)	1.66 (1.50-1.83)	2.31 (1.94-2.82)	822
Non-Hispanic whites (2001 - 2002)	.615 (.579-.654)	.621 (.571-.667)	1.00 (.933-1.07)	1.46 (1.37-1.52)	1.88 (1.62-2.03)	1132
Non-Hispanic whites (2003 - 2004)	.623 (.592-.655)	.618 (.587-.657)	.971 (.914-1.03)	1.44 (1.25-1.61)	1.85 (1.64-2.10)	1074
Non-Hispanic whites (2005 - 2006)	.541 (.500-.585)	.530 (.490-.580)	.850 (.790-.920)	1.24 (1.12-1.37)	1.62 (1.37-1.94)	1041
Non-Hispanic whites (2007 - 2008)	.506 (.466-.550)	.490 (.460-.540)	.790 (.700-.880)	1.27 (1.15-1.42)	1.81 (1.59-1.96)	1095
Non-Hispanic whites (2009 - 2010)	.482 (.448-.518)	.460 (.430-.500)	.740 (.690-.820)	1.15 (1.01-1.30)	1.46 (1.32-1.59)	1225

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Urinary Lead (creatinine corrected) (2011 – 2016)

CAS Number 7439-92-1

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.409 (.380-.440)	.396 (.374-.418)	.634 (.583-.675)	1.00 (.878-1.16)	1.51 (1.24-1.71)	2502
Total population (2013 - 2014)	.320 (.302-.339)	.313 (.294-.331)	.519 (.491-.554)	.823 (.756-.907)	1.16 (1.00-1.30)	2663
Total population (2015 - 2016)	.319 (.294-.346)	.302 (.279-.325)	.525 (.477-.560)	.870 (.766-.981)	1.13 (1.04-1.27)	3058
Age 3-5 years (2015 - 2016)	.590 (.532-.654)	.577 (.486-.658)	.897 (.783-1.07)	1.41 (1.13-1.89)	2.05 (1.50-2.69)	485
Age 6-11 years (2011 - 2012)	.494 (.430-.567)	.459 (.414-.529)	.708 (.559-.930)	1.18 (.884-1.56)	1.56 (1.12-2.22)	398
Age 6-11 years (2013 - 2014)	.331 (.297-.370)	.313 (.273-.370)	.500 (.452-.571)	.833 (.667-.938)	1.07 (.905-1.34)	402
Age 6-11 years (2015 - 2016)	.364 (.326-.406)	.329 (.278-.400)	.538 (.455-.642)	.857 (.714-1.05)	1.14 (.859-1.49)	379
Age 12-19 years (2011 - 2012)	.247 (.218-.281)	.224 (.206-.264)	.385 (.317-.429)	.541 (.440-.667)	.667 (.513-1.03)	390
Age 12-19 years (2013 - 2014)	.182 (.160-.208)	.169 (.142-.194)	.276 (.225-.330)	.457 (.339-.640)	.640 (.438-.908)	451
Age 12-19 years (2015 - 2016)	.183 (.166-.202)	.174 (.160-.194)	.260 (.226-.288)	.385 (.310-.521)	.538 (.392-.774)	402
Age 20+ years (2011 - 2012)	.433 (.402-.466)	.414 (.389-.437)	.660 (.619-.712)	1.05 (.929-1.22)	1.61 (1.28-1.87)	1714
Age 20+ years (2013 - 2014)	.346 (.331-.363)	.337 (.321-.353)	.554 (.505-.592)	.861 (.789-.935)	1.23 (1.04-1.46)	1810
Age 20+ years (2015 - 2016)	.331 (.303-.363)	.315 (.288-.350)	.541 (.492-.581)	.900 (.754-1.02)	1.14 (1.03-1.28)	1792
Males (2011 - 2012)	.388 (.346-.436)	.377 (.338-.418)	.590 (.524-.658)	.987 (.833-1.17)	1.51 (1.16-1.89)	1261
Males (2013 - 2014)	.315 (.293-.339)	.303 (.278-.327)	.486 (.440-.541)	.758 (.692-.913)	1.16 (.956-1.58)	1317
Males (2015 - 2016)	.297 (.269-.328)	.275 (.254-.309)	.500 (.422-.553)	.787 (.700-.923)	1.05 (.874-1.23)	1524
Females (2011 - 2012)	.430 (.405-.457)	.416 (.385-.444)	.667 (.626-.709)	1.03 (.905-1.21)	1.49 (1.21-1.71)	1241
Females (2013 - 2014)	.325 (.303-.348)	.325 (.308-.336)	.545 (.500-.580)	.864 (.785-.929)	1.18 (.970-1.33)	1346
Females (2015 - 2016)	.341 (.311-.374)	.324 (.300-.360)	.542 (.490-.608)	.941 (.780-1.13)	1.22 (1.09-1.37)	1534
Mexican Americans (2011 - 2012)	.418 (.370-.471)	.409 (.356-.462)	.667 (.598-.716)	1.05 (.822-1.25)	1.32 (1.16-1.54)	317
Mexican Americans (2013 - 2014)	.316 (.283-.352)	.319 (.278-.336)	.500 (.450-.589)	.845 (.720-1.04)	1.16 (.908-1.36)	453
Mexican Americans (2015 - 2016)	.323 (.288-.363)	.303 (.274-.331)	.510 (.423-.594)	.866 (.743-1.02)	1.21 (1.00-1.56)	584
Non-Hispanic blacks (2011 - 2012)	.335 (.301-.374)	.316 (.269-.357)	.529 (.464-.598)	.906 (.770-1.07)	1.34 (1.06-1.55)	669
Non-Hispanic blacks (2013 - 2014)	.282 (.251-.317)	.275 (.237-.316)	.455 (.398-.515)	.750 (.611-.920)	.977 (.836-1.21)	581
Non-Hispanic blacks (2015 - 2016)	.270 (.236-.309)	.252 (.218-.286)	.413 (.335-.516)	.750 (.561-.933)	1.06 (.857-1.16)	669
Non-Hispanic whites (2011 - 2012)	.419 (.378-.465)	.404 (.369-.439)	.642 (.559-.722)	.966 (.826-1.22)	1.62 (1.16-2.00)	818
Non-Hispanic whites (2013 - 2014)	.329 (.306-.353)	.317 (.293-.344)	.541 (.486-.589)	.860 (.750-.933)	1.23 (.983-1.60)	984
Non-Hispanic whites (2015 - 2016)	.324 (.293-.358)	.306 (.275-.348)	.538 (.484-.590)	.896 (.747-1.03)	1.14 (1.00-1.28)	924
All Hispanics (2011 - 2012)	.416 (.377-.460)	.401 (.366-.442)	.641 (.561-.694)	1.02 (.851-1.24)	1.40 (1.16-1.65)	573
All Hispanics (2013 - 2014)	.301 (.276-.328)	.307 (.269-.327)	.473 (.438-.508)	.795 (.667-.882)	1.07 (.882-1.24)	701
All Hispanics (2015 - 2016)	.321 (.294-.351)	.303 (.280-.324)	.510 (.453-.573)	.857 (.752-.980)	1.13 (1.00-1.41)	981
Asians (2011 - 2012)	.511 (.453-.577)	.512 (.440-.588)	.829 (.706-.980)	1.28 (1.05-1.57)	1.61 (1.40-2.22)	353
Asians (2013 - 2014)	.403 (.360-.451)	.417 (.342-.503)	.619 (.549-.708)	.929 (.767-1.03)	1.12 (.955-1.33)	292
Asians (2015 - 2016)	.399 (.353-.452)	.403 (.350-.464)	.647 (.524-.829)	.966 (.837-1.25)	1.34 (.935-1.69)	332

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Lead_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Lead_FactSheet.html

Blood Manganese (2011 – 2016)

CAS Number 8075-39-6

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	9.35 (9.19-9.51)	9.22 (9.04-9.40)	11.5 (11.3-11.7)	14.4 (14.2-14.6)	16.7 (16.2-17.3)	7920
Total population (2013 - 2014)	9.52 (9.35-9.70)	9.41 (9.23-9.62)	11.8 (11.5-12.1)	14.6 (14.2-15.0)	16.7 (15.9-17.3)	5215
Total population (2015 - 2016)	9.59 (9.36-9.82)	9.52 (9.23-9.73)	12.0 (11.6-12.3)	14.8 (14.5-15.1)	16.4 (15.9-17.3)	4987
Age 1-5 years (2011 - 2012)	10.7 (10.2-11.2)	10.6 (10.1-11.2)	13.2 (12.6-13.5)	15.3 (14.5-16.8)	18.2 (15.3-19.7)	713
Age 1-5 years (2013 - 2014)	10.9 (10.6-11.1)	10.7 (10.5-11.0)	13.2 (12.6-13.6)	16.1 (14.8-16.9)	18.3 (16.9-19.0)	818
Age 1-5 years (2015 - 2016)	10.8 (10.3-11.3)	10.8 (10.4-11.3)	12.9 (12.4-13.7)	15.6 (14.6-17.2)	18.3 (16.5-19.3)	790
Age 6-11 years (2011 - 2012)	10.3 (9.98-10.6)	10.2 (9.83-10.4)	12.6 (12.2-12.8)	14.9 (14.2-15.5)	16.5 (16.0-17.6)	1048
Age 6-11 years (2013 - 2014)	10.2 (9.87-10.6)	10.2 (9.95-10.6)	12.4 (12.0-13.0)	14.8 (14.2-15.6)	16.4 (15.5-17.1)	1075
Age 6-11 years (2015 - 2016)	10.4 (10.1-10.7)	10.4 (10.1-10.6)	12.6 (12.3-13.1)	15.2 (14.3-16.2)	17.1 (15.6-18.3)	1023
Age 12-19 years (2011 - 2012)	10.1 (9.67-10.5)	9.90 (9.42-10.8)	12.5 (11.7-13.2)	14.8 (14.1-15.4)	16.6 (15.3-17.9)	1129
Age 12-19 years (2013 - 2014)	10.4 (10.0-10.8)	10.1 (9.55-10.6)	13.4 (12.5-13.9)	16.1 (15.0-17.4)	17.9 (16.1-20.3)	627
Age 12-19 years (2015 - 2016)	10.5 (10.1-10.9)	10.4 (9.81-10.9)	13.1 (12.1-13.9)	15.6 (14.9-16.2)	17.3 (16.4-18.3)	565
Age 20+ years (2011 - 2012)	9.09 (8.94-9.24)	8.96 (8.83-9.11)	11.1 (10.9-11.3)	14.1 (13.7-14.5)	16.7 (16.1-17.3)	5030
Age 20+ years (2013 - 2014)	9.27 (9.11-9.43)	9.22 (9.01-9.39)	11.4 (11.2-11.7)	14.1 (13.9-14.6)	16.2 (15.5-17.0)	2695
Age 20+ years (2015 - 2016)	9.34 (9.11-9.58)	9.20 (8.92-9.51)	11.6 (11.4-11.8)	14.7 (14.1-15.1)	16.1 (15.6-16.9)	2609
Males (2011 - 2012)	8.74 (8.58-8.91)	8.78 (8.65-8.91)	10.6 (10.3-10.9)	13.0 (12.7-13.4)	14.9 (14.4-15.3)	3968
Males (2013 - 2014)	8.92 (8.76-9.09)	8.96 (8.70-9.19)	10.9 (10.6-11.1)	13.3 (12.9-13.6)	14.7 (14.2-15.2)	2587
Males (2015 - 2016)	8.99 (8.74-9.25)	8.82 (8.59-9.17)	11.2 (10.8-11.6)	13.4 (13.1-14.0)	15.1 (14.5-15.5)	2488
Females (2011 - 2012)	9.96 (9.75-10.2)	9.72 (9.52-10.0)	12.4 (12.0-12.9)	15.5 (15.2-15.9)	17.8 (17.4-18.4)	3952
Females (2013 - 2014)	10.1 (9.86-10.4)	9.93 (9.57-10.4)	12.6 (12.3-13.0)	15.7 (15.1-16.4)	17.9 (17.0-19.2)	2628
Females (2015 - 2016)	10.2 (9.95-10.4)	10.1 (9.83-10.3)	12.7 (12.3-13.2)	15.7 (15.2-16.2)	17.9 (17.0-18.4)	2499
Mexican Americans (2011 - 2012)	10.7 (10.4-11.0)	10.7 (10.3-11.0)	13.2 (12.9-13.5)	16.4 (15.2-17.1)	19.1 (17.7-20.3)	1077
Mexican Americans (2013 - 2014)	10.9 (10.6-11.3)	11.0 (10.6-11.3)	13.6 (13.1-14.0)	16.4 (15.2-17.4)	18.0 (17.1-19.9)	969
Mexican Americans (2015 - 2016)	11.1 (10.8-11.4)	11.1 (10.7-11.4)	13.6 (13.2-14.1)	16.7 (15.9-17.2)	18.6 (17.9-19.8)	994
Non-Hispanic blacks (2011 - 2012)	8.34 (8.19-8.49)	8.18 (8.04-8.33)	10.1 (9.81-10.4)	12.7 (12.0-13.3)	15.5 (14.5-16.5)	2195
Non-Hispanic blacks (2013 - 2014)	8.23 (8.04-8.43)	8.17 (7.87-8.47)	10.0 (9.72-10.4)	12.5 (12.1-12.8)	14.0 (13.4-15.1)	1119
Non-Hispanic blacks (2015 - 2016)	8.46 (8.18-8.75)	8.53 (8.17-8.81)	10.2 (9.84-10.6)	12.5 (12.0-13.4)	14.5 (13.2-16.1)	1070
Non-Hispanic whites (2011 - 2012)	9.08 (8.91-9.26)	9.01 (8.79-9.21)	11.1 (10.9-11.3)	13.7 (13.3-14.2)	15.9 (15.2-16.4)	2493
Non-Hispanic whites (2013 - 2014)	9.27 (9.07-9.48)	9.18 (8.96-9.38)	11.2 (10.9-11.5)	14.0 (13.0-14.5)	15.7 (14.7-17.0)	1848
Non-Hispanic whites (2015 - 2016)	9.37 (9.08-9.67)	9.26 (8.91-9.65)	11.6 (11.2-11.9)	14.5 (13.4-14.9)	15.7 (15.1-16.4)	1510
All Hispanics (2011 - 2012)	10.4 (10.1-10.8)	10.3 (9.95-10.7)	12.8 (12.3-13.3)	15.7 (14.9-16.7)	18.3 (17.3-19.2)	1931
All Hispanics (2013 - 2014)	10.6 (10.3-10.9)	10.6 (10.4-10.8)	13.2 (12.9-13.5)	16.1 (15.2-16.7)	17.8 (17.1-18.7)	1481
All Hispanics (2015 - 2016)	10.8 (10.5-11.1)	10.7 (10.4-11.1)	13.4 (12.9-13.8)	16.3 (15.6-16.9)	18.1 (17.5-18.7)	1664
Asians (2011 - 2012)	11.9 (11.5-12.4)	11.8 (11.4-12.3)	14.7 (14.1-15.3)	17.6 (16.8-18.4)	19.8 (19.0-21.1)	1005
Asians (2013 - 2014)	12.4 (12.0-12.8)	12.6 (12.0-13.0)	15.0 (14.7-15.5)	17.5 (16.8-18.4)	19.4 (18.4-20.4)	510
Asians (2015 - 2016)	12.1 (11.5-12.8)	12.0 (11.3-13.0)	14.9 (14.1-15.6)	17.9 (16.3-19.2)	19.8 (18.3-21.3)	479

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 1.06, 0.99, and 0.99 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Urinary Magnanese (2011 – 2016)

CAS Number 8075-39-6

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.123 (.112-.136)	.120 (.100-.140)	.200 (.180-.230)	.300 (.270-.310)	.370 (.320-.450)	2504
Total population (2013 - 2014)	*	< LOD	.130 (<LOD-.150)	.220 (.200-.230)	.300 (.260-.330)	2664
Total population (2015 - 2016)	*	< LOD	.140 (.130-.150)	.220 (.200-.230)	.300 (.270-.360)	3061
Age 3-5 years (2015 - 2016)	*	< LOD	.150 (.140-.170)	.260 (.230-.330)	.370 (.290-.530)	486
Age 6-11 years (2011 - 2012)	.143 (.126-.162)	.150 (.120-.180)	.250 (.210-.300)	.340 (.310-.450)	.460 (.350-.540)	399
Age 6-11 years (2013 - 2014)	*	< LOD	.150 (<LOD-.190)	.220 (.180-.320)	.310 (.220-.460)	402
Age 6-11 years (2015 - 2016)	*	< LOD	.150 (.130-.180)	.290 (.240-.350)	.460 (.320-.560)	379
Age 12-19 years (2011 - 2012)	.128 (.107-.153)	.120 (.090-.160)	.220 (.160-.280)	.310 (.250-.420)	.430 (.310-.570)	390
Age 12-19 years (2013 - 2014)	*	< LOD	.140 (.130-.170)	.250 (.220-.330)	.380 (.300-.520)	451
Age 12-19 years (2015 - 2016)	*	< LOD	.150 (.130-.190)	.250 (.210-.310)	.470 (.250-.690)	402
Age 20+ years (2011 - 2012)	.121 (.109-.134)	.120 (.100-.140)	.190 (.180-.220)	.280 (.250-.300)	.350 (.300-.440)	1715
Age 20+ years (2013 - 2014)	*	< LOD	.130 (<LOD-.140)	.210 (.190-.220)	.280 (.240-.320)	1811
Age 20+ years (2015 - 2016)	*	< LOD	.130 (<LOD-.140)	.200 (.180-.220)	.280 (.240-.320)	1794
Males (2011 - 2012)	.121 (.108-.136)	.120 (.100-.140)	.190 (.170-.220)	.280 (.250-.310)	.350 (.300-.390)	1262
Males (2013 - 2014)	*	< LOD	< LOD	.190 (.160-.210)	.240 (.210-.260)	1318
Males (2015 - 2016)	*	< LOD	< LOD	.190 (.170-.200)	.270 (.220-.310)	1524
Females (2011 - 2012)	.126 (.114-.138)	.120 (.100-.140)	.210 (.190-.240)	.300 (.270-.350)	.410 (.340-.520)	1242
Females (2013 - 2014)	*	< LOD	.150 (.130-.160)	.240 (.210-.290)	.350 (.300-.400)	1346
Females (2015 - 2016)	*	< LOD	.150 (.130-.170)	.240 (.220-.270)	.350 (.280-.500)	1537
Mexican Americans (2011 - 2012)	.129 (.116-.144)	.130 (.110-.150)	.220 (.190-.250)	.300 (.260-.360)	.360 (.300-.440)	317
Mexican Americans (2013 - 2014)	*	< LOD	.150 (<LOD-.180)	.220 (.180-.250)	.250 (.220-.410)	453
Mexican Americans (2015 - 2016)	*	< LOD	.160 (.140-.180)	.220 (.210-.250)	.300 (.270-.390)	585
Non-Hispanic blacks (2011 - 2012)	.132 (.116-.150)	.140 (.100-.170)	.220 (.200-.240)	.310 (.280-.360)	.380 (.320-.480)	669
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.150 (.140-.180)	.250 (.200-.310)	.350 (.290-.410)	581
Non-Hispanic blacks (2015 - 2016)	*	< LOD	.150 (.130-.170)	.250 (.210-.270)	.310 (.260-.390)	671
Non-Hispanic whites (2011 - 2012)	.123 (.109-.138)	.120 (.100-.140)	.200 (.170-.230)	.300 (.250-.340)	.390 (.300-.510)	820
Non-Hispanic whites (2013 - 2014)	*	< LOD	.130 (<LOD-.140)	.210 (.180-.240)	.290 (.240-.340)	985
Non-Hispanic whites (2015 - 2016)	*	< LOD	.130 (<LOD-.140)	.200 (.170-.240)	.300 (.220-.480)	924
All Hispanics (2011 - 2012)	.120 (.110-.132)	.120 (.100-.150)	.200 (.180-.230)	.290 (.260-.300)	.330 (.300-.380)	573
All Hispanics (2013 - 2014)	*	< LOD	.140 (<LOD-.160)	.210 (.190-.240)	.250 (.220-.380)	701
All Hispanics (2015 - 2016)	*	< LOD	.150 (.130-.160)	.230 (.210-.250)	.290 (.270-.350)	982
Asians (2011 - 2012)	.125 (.108-.143)	.120 (.090-.160)	.220 (.180-.250)	.300 (.270-.360)	.410 (.300-.490)	353
Asians (2013 - 2014)	*	< LOD	< LOD	.190 (.150-.250)	.260 (.200-.300)	292
Asians (2015 - 2016)	*	< LOD	< LOD	.200 (.150-.240)	.250 (.210-.320)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.08, 0.13, and 0.13, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary Manganese (creatinine corrected) (2011 – 2016)

CAS Number 8075-39-6

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.140 (.126-.155)	.139 (.119-.154)	.233 (.206-.273)	.389 (.354-.444)	.548 (.500-.625)	2502
Total population (2013 - 2014)	*	< LOD	.219 (<LOD-.240)	.368 (.329-.418)	.541 (.438-.657)	2663
Total population (2015 - 2016)	*	< LOD	.219 (.200-.242)	.375 (.338-.438)	.531 (.476-.600)	3058
Age 3-5 years (2015 - 2016)	*	< LOD	.438 (.400-.511)	.813 (.655-1.02)	1.27 (.920-2.04)	485
Age 6-11 years (2011 - 2012)	.201 (.175-.231)	.197 (.173-.238)	.308 (.285-.358)	.486 (.388-.600)	.633 (.511-.750)	398
Age 6-11 years (2013 - 2014)	*	< LOD	.297 (<LOD-.400)	.495 (.383-.657)	.708 (.532-.844)	402
Age 6-11 years (2015 - 2016)	*	< LOD	.271 (.242-.306)	.484 (.359-.571)	.724 (.511-1.20)	379
Age 12-19 years (2011 - 2012)	.122 (.105-.143)	.125 (.099-.150)	.200 (.174-.213)	.297 (.220-.429)	.490 (.271-.814)	390
Age 12-19 years (2013 - 2014)	*	< LOD	.180 (.148-.204)	.279 (.228-.354)	.396 (.288-.460)	451
Age 12-19 years (2015 - 2016)	*	< LOD	.179 (.148-.219)	.280 (.236-.444)	.600 (.288-1.02)	402
Age 20+ years (2011 - 2012)	.137 (.124-.151)	.133 (.117-.148)	.232 (.197-.276)	.389 (.347-.455)	.545 (.487-.600)	1714
Age 20+ years (2013 - 2014)	*	< LOD	.217 (<LOD-.237)	.355 (.329-.400)	.541 (.434-.657)	1810
Age 20+ years (2015 - 2016)	*	< LOD	.209 (<LOD-.226)	.368 (.307-.418)	.487 (.438-.575)	1792
Males (2011 - 2012)	.113 (.101-.127)	.111 (.098-.127)	.182 (.165-.197)	.318 (.248-.357)	.388 (.349-.487)	1261
Males (2013 - 2014)	*	< LOD	< LOD	.279 (.263-.297)	.383 (.317-.460)	1317
Males (2015 - 2016)	*	< LOD	< LOD	.288 (.249-.329)	.438 (.341-.511)	1524
Females (2011 - 2012)	.171 (.153-.191)	.161 (.145-.194)	.286 (.250-.324)	.500 (.406-.571)	.635 (.571-.980)	1241
Females (2013 - 2014)	*	< LOD	.271 (.237-.307)	.438 (.368-.511)	.613 (.511-.836)	1346
Females (2015 - 2016)	*	< LOD	.270 (.249-.297)	.438 (.383-.511)	.636 (.535-.708)	1534
Mexican Americans (2011 - 2012)	.145 (.125-.169)	.139 (.119-.172)	.237 (.196-.277)	.359 (.300-.419)	.439 (.375-.600)	317
Mexican Americans (2013 - 2014)	*	< LOD	.212 (<LOD-.233)	.341 (.288-.368)	.405 (.341-.651)	453
Mexican Americans (2015 - 2016)	*	< LOD	.219 (.188-.242)	.356 (.283-.460)	.575 (.436-.708)	584
Non-Hispanic blacks (2011 - 2012)	.102 (.090-.117)	.102 (.085-.117)	.172 (.149-.200)	.272 (.231-.351)	.406 (.351-.547)	669
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.146 (.133-.155)	.242 (.219-.271)	.333 (.283-.540)	581
Non-Hispanic blacks (2015 - 2016)	*	< LOD	.142 (.133-.152)	.270 (.235-.283)	.368 (.327-.431)	669
Non-Hispanic whites (2011 - 2012)	.148 (.132-.166)	.145 (.127-.162)	.248 (.212-.300)	.410 (.375-.490)	.550 (.512-.633)	818
Non-Hispanic whites (2013 - 2014)	*	< LOD	.237 (<LOD-.271)	.402 (.329-.483)	.541 (.484-.700)	984
Non-Hispanic whites (2015 - 2016)	*	< LOD	.230 (<LOD-.263)	.397 (.341-.449)	.520 (.460-.614)	924
All Hispanics (2011 - 2012)	.135 (.121-.150)	.129 (.114-.146)	.221 (.190-.250)	.356 (.317-.380)	.469 (.386-.574)	573
All Hispanics (2013 - 2014)	*	< LOD	.200 (<LOD-.219)	.329 (.271-.368)	.400 (.345-.541)	701
All Hispanics (2015 - 2016)	*	< LOD	.219 (.188-.243)	.368 (.317-.460)	.600 (.484-.659)	981
Asians (2011 - 2012)	.167 (.138-.201)	.164 (.133-.198)	.271 (.219-.360)	.462 (.406-.577)	.641 (.500-.980)	353
Asians (2013 - 2014)	*	< LOD	< LOD	.383 (.341-.484)	.514 (.418-.769)	292
Asians (2015 - 2016)	*	< LOD	< LOD	.419 (.329-.541)	.575 (.400-.708)	332

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Total Mercury (2003 – 2010)

CAS Number 92786-62-4

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	.797 (.703-.903)	.800 (.700-.900)	1.70 (1.50-1.90)	3.30 (2.90-3.90)	4.90 (4.30-5.50)	8373
Total population (2005 - 2006)	.863 (.787-.946)	.830 (.760-.920)	1.66 (1.48-1.93)	3.20 (2.87-3.54)	4.64 (4.17-5.25)	8407
Total population (2007 - 2008)	.769 (.689-.859)	.740 (.660-.830)	1.48 (1.29-1.69)	2.95 (2.46-3.59)	4.64 (3.74-5.79)	8266
Total population (2009 - 2010)	.863 (.792-.941)	.790 (.730-.880)	1.68 (1.49-1.91)	3.43 (3.07-3.84)	5.13 (4.57-5.67)	8793
Age 1-5 years (2003 - 2004)	.326 (.285-.372)	.300 (.300-.300)	.500 (.500-.700)	1.00 (.800-1.60)	1.80 (1.30-2.50)	911
Age 1-5 years (2005 - 2006)	*	< LOD	.500 (.470-.550)	.940 (.820-1.24)	1.43 (1.25-1.59)	968
Age 1-5 years (2007 - 2008)	*	< LOD	.440 (.380-.540)	.830 (.620-1.12)	1.32 (.960-2.40)	817
Age 1-5 years (2009 - 2010)	*	< LOD	.490 (.430-.590)	.890 (.740-1.08)	1.30 (1.08-1.52)	836
Age 6-11 years (2003 - 2004)	.419 (.363-.484)	.400 (.400-.500)	.700 (.700-.900)	1.30 (1.00-1.60)	1.90 (1.40-3.50)	856
Age 6-11 years (2005 - 2006)	*	.410 (.330-.460)	.740 (.630-1.00)	1.43 (1.21-1.87)	2.34 (1.53-3.42)	934
Age 6-11 years (2007 - 2008)	*	.380 (.340-.440)	.700 (.600-.790)	1.21 (.970-1.36)	1.56 (1.34-1.80)	1011
Age 6-11 years (2009 - 2010)	*	.360 (<LOD-.400)	.670 (.590-.770)	1.22 (1.05-1.45)	1.88 (1.43-2.61)	1009
Age 12-19 years (2003 - 2004)	.490 (.418-.574)	.500 (.400-.600)	1.00 (.800-1.20)	1.80 (1.40-2.30)	2.60 (2.10-3.30)	2081
Age 12-19 years (2005 - 2006)	.513 (.461-.570)	.460 (.390-.530)	.850 (.740-1.04)	1.66 (1.31-1.98)	2.41 (2.12-2.90)	1996
Age 12-19 years (2007 - 2008)	.469 (.426-.516)	.440 (.390-.490)	.800 (.670-.970)	1.55 (1.30-1.72)	2.05 (1.77-2.34)	1074
Age 12-19 years (2009 - 2010)	.534 (.473-.602)	.450 (.370-.540)	.910 (.770-1.11)	2.04 (1.53-2.55)	3.01 (2.53-3.63)	1183
Age 20+ years (2003 - 2004)	.979 (.860-1.12)	1.00 (.800-1.10)	2.00 (1.70-2.30)	3.80 (3.20-4.40)	5.40 (4.60-6.70)	4525
Age 20+ years (2005 - 2006)	1.06 (.967-1.15)	1.03 (.930-1.15)	1.98 (1.73-2.22)	3.64 (3.33-4.01)	5.31 (4.82-5.67)	4509
Age 20+ years (2007 - 2008)	.944 (.833-1.07)	.890 (.780-1.03)	1.73 (1.47-2.09)	3.41 (2.82-4.17)	5.32 (4.32-6.72)	5364
Age 20+ years (2009 - 2010)	1.04 (.956-1.14)	.970 (.870-1.08)	2.00 (1.80-2.20)	3.96 (3.55-4.27)	5.75 (5.14-6.50)	5765
Males (2003 - 2004)	.814 (.714-.927)	.800 (.700-.900)	1.80 (1.50-2.00)	3.70 (3.20-4.30)	5.40 (4.60-6.50)	4132
Males (2005 - 2006)	.864 (.783-.954)	.810 (.720-.940)	1.69 (1.48-2.01)	3.30 (2.86-3.73)	4.83 (4.08-5.45)	4092
Males (2007 - 2008)	.809 (.709-.923)	.760 (.670-.850)	1.56 (1.31-1.81)	3.21 (2.72-4.06)	5.16 (4.12-6.97)	4147
Males (2009 - 2010)	.883 (.810-.962)	.790 (.730-.870)	1.75 (1.54-2.02)	3.84 (3.35-4.26)	5.65 (5.13-6.34)	4366
Females (2003 - 2004)	.781 (.689-.886)	.800 (.700-.900)	1.60 (1.40-1.80)	3.00 (2.50-3.50)	4.40 (3.60-5.30)	4241
Females (2005 - 2006)	.864 (.791-.943)	.850 (.770-.920)	1.63 (1.44-1.89)	3.09 (2.75-3.46)	4.51 (4.01-5.28)	4315
Females (2007 - 2008)	.748 (.677-.827)	.720 (.660-.810)	1.42 (1.24-1.60)	2.70 (2.27-3.27)	3.93 (3.17-5.16)	4119
Females (2009 - 2010)	.845 (.772-.924)	.800 (.720-.880)	1.61 (1.43-1.81)	3.13 (2.76-3.48)	4.43 (4.04-5.11)	4427
Mexican Americans (2003 - 2004)	.563 (.472-.672)	.600 (.500-.700)	1.00 (.800-1.30)	1.90 (1.60-2.40)	3.00 (2.20-3.80)	2085
Mexican Americans (2005 - 2006)	.597 (.524-.679)	.580 (.490-.670)	1.04 (.870-1.24)	1.70 (1.40-2.12)	2.58 (1.96-3.31)	2236
Mexican Americans (2007 - 2008)	.594 (.536-.658)	.580 (.520-.670)	1.03 (.900-1.17)	1.73 (1.49-2.04)	2.48 (2.10-2.91)	1712
Mexican Americans (2009 - 2010)	.613 (.571-.659)	.580 (.540-.630)	1.01 (.890-1.15)	1.63 (1.47-1.90)	2.45 (2.03-2.93)	1966
Non-Hispanic blacks (2003 - 2004)	.877 (.753-1.02)	.900 (.800-1.00)	1.60 (1.40-1.80)	3.00 (2.30-4.00)	4.40 (3.30-6.00)	2293
Non-Hispanic blacks (2005 - 2006)	.823 (.697-.972)	.800 (.670-.940)	1.50 (1.21-1.92)	2.72 (2.14-3.59)	4.09 (3.22-5.16)	2193
Non-Hispanic blacks (2007 - 2008)	.766 (.711-.825)	.780 (.710-.830)	1.32 (1.23-1.42)	2.25 (1.99-2.58)	3.42 (2.74-3.90)	1746
Non-Hispanic blacks (2009 - 2010)	.928 (.805-1.07)	.900 (.800-1.02)	1.67 (1.38-1.96)	2.93 (2.20-4.21)	4.56 (3.34-6.69)	1593
Non-Hispanic whites (2003 - 2004)	.776 (.655-.919)	.800 (.700-.900)	1.70 (1.40-2.00)	3.20 (2.60-3.90)	4.70 (4.00-5.60)	3478
Non-Hispanic whites (2005 - 2006)	.891 (.801-.992)	.870 (.770-1.00)	1.74 (1.50-2.10)	3.37 (2.88-3.76)	4.76 (4.18-5.37)	3310
Non-Hispanic whites (2007 - 2008)	.743 (.651-.847)	.720 (.620-.820)	1.43 (1.18-1.70)	2.79 (2.33-3.41)	4.18 (3.57-4.83)	3461
Non-Hispanic whites (2009 - 2010)	.856 (.766-.957)	.790 (.690-.920)	1.70 (1.46-1.98)	3.43 (2.94-3.94)	4.92 (4.30-5.65)	3760

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.2, 0.33, 0.33, and 0.33 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Blood Total Mercury (2011 – 2016)

CAS Number 92786-62-4

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.703 (.617-.801)	.640 (.580-.730)	1.38 (1.14-1.72)	2.87 (2.39-3.62)	4.40 (3.50-5.71)	7920
Total population (2013 - 2014)	.683 (.621-.751)	.620 (.540-.690)	1.29 (1.14-1.46)	2.65 (2.32-3.08)	4.36 (3.65-4.97)	5215
Total population (2015 - 2016)	.678 (.619-.743)	.600 (.540-.690)	1.26 (1.07-1.47)	2.55 (2.17-3.10)	4.25 (3.44-4.94)	4988
Age 1-5 years (2011 - 2012)	.262 (.237-.291)	.250 (.220-.270)	.390 (.340-.450)	.680 (.540-.880)	.990 (.790-1.21)	713
Age 1-5 years (2013 - 2014)	*	< LOD	.410 (.370-.450)	.810 (.710-.990)	1.21 (1.05-1.48)	818
Age 1-5 years (2015 - 2016)	*	< LOD	.380 (.340-.430)	.690 (.540-.830)	1.06 (.840-1.36)	790
Age 6-11 years (2011 - 2012)	.330 (.287-.379)	.320 (.280-.360)	.530 (.480-.600)	.930 (.780-1.20)	1.40 (1.02-2.17)	1048
Age 6-11 years (2013 - 2014)	*	.300 (<LOD-.360)	.570 (.470-.680)	1.12 (.980-1.36)	1.62 (1.38-2.19)	1075
Age 6-11 years (2015 - 2016)	*	.310 (.290-.340)	.480 (.430-.570)	.920 (.750-1.13)	1.33 (1.01-2.28)	1023
Age 12-19 years (2011 - 2012)	.411 (.355-.476)	.370 (.320-.450)	.680 (.590-.800)	1.32 (1.08-1.75)	2.25 (1.46-2.87)	1129
Age 12-19 years (2013 - 2014)	.412 (.367-.463)	.350 (.310-.420)	.630 (.530-.750)	1.20 (.900-1.67)	1.87 (1.30-2.38)	627
Age 12-19 years (2015 - 2016)	.395 (.356-.439)	.340 (.300-.370)	.590 (.470-.750)	1.00 (.850-1.35)	1.89 (1.02-3.34)	565
Age 20+ years (2011 - 2012)	.863 (.753-.990)	.790 (.690-.940)	1.68 (1.36-2.12)	3.35 (2.71-4.31)	5.02 (3.94-6.96)	5030
Age 20+ years (2013 - 2014)	.814 (.736-.900)	.740 (.650-.850)	1.54 (1.36-1.71)	3.08 (2.73-3.56)	4.88 (4.36-5.21)	2695
Age 20+ years (2015 - 2016)	.810 (.740-.886)	.740 (.660-.830)	1.47 (1.28-1.75)	2.86 (2.50-3.44)	4.66 (3.91-5.96)	2610
Males (2011 - 2012)	.712 (.623-.815)	.650 (.570-.730)	1.40 (1.17-1.72)	3.00 (2.44-3.91)	4.94 (3.50-6.79)	3968
Males (2013 - 2014)	.688 (.617-.767)	.620 (.530-.720)	1.30 (1.12-1.54)	2.76 (2.36-3.34)	4.52 (3.65-5.23)	2587
Males (2015 - 2016)	.679 (.621-.743)	.610 (.530-.700)	1.29 (1.06-1.60)	2.45 (2.06-3.31)	4.67 (3.77-5.39)	2488
Females (2011 - 2012)	.694 (.609-.791)	.640 (.580-.740)	1.36 (1.09-1.75)	2.81 (2.28-3.50)	4.03 (3.29-5.08)	3952
Females (2013 - 2014)	.678 (.617-.745)	.610 (.530-.700)	1.27 (1.14-1.42)	2.56 (2.17-3.08)	4.15 (3.37-4.93)	2628
Females (2015 - 2016)	.677 (.608-.754)	.600 (.530-.700)	1.23 (1.02-1.42)	2.57 (2.20-3.10)	3.95 (3.10-4.55)	2500
Mexican Americans (2011 - 2012)	.483 (.424-.550)	.480 (.400-.560)	.810 (.720-.900)	1.44 (1.16-1.63)	1.90 (1.57-2.19)	1077
Mexican Americans (2013 - 2014)	.487 (.433-.547)	.430 (.390-.510)	.760 (.690-.870)	1.41 (1.14-1.69)	1.98 (1.70-2.38)	969
Mexican Americans (2015 - 2016)	.540 (.522-.559)	.530 (.470-.570)	.840 (.790-.920)	1.41 (1.19-1.60)	1.81 (1.54-2.33)	994
Non-Hispanic blacks (2011 - 2012)	.679 (.542-.852)	.630 (.500-.790)	1.24 (.880-1.72)	2.45 (1.84-3.14)	3.80 (2.70-5.37)	2195
Non-Hispanic blacks (2013 - 2014)	.699 (.614-.796)	.650 (.570-.750)	1.20 (1.08-1.40)	2.30 (1.65-2.96)	3.34 (2.35-5.93)	1119
Non-Hispanic blacks (2015 - 2016)	.698 (.587-.829)	.630 (.510-.760)	1.21 (1.04-1.47)	2.49 (2.01-3.51)	4.51 (2.74-5.87)	1070
Non-Hispanic whites (2011 - 2012)	.688 (.582-.813)	.630 (.550-.750)	1.38 (1.09-1.82)	2.83 (2.18-3.82)	4.25 (3.02-6.24)	2493
Non-Hispanic whites (2013 - 2014)	.672 (.598-.755)	.620 (.520-.720)	1.30 (1.12-1.51)	2.61 (2.18-3.08)	4.15 (3.35-4.98)	1848
Non-Hispanic whites (2015 - 2016)	.638 (.563-.723)	.570 (.500-.670)	1.22 (.940-1.47)	2.29 (1.82-2.72)	3.95 (2.56-4.55)	1511
All Hispanics (2011 - 2012)	.612 (.527-.710)	.590 (.490-.700)	1.08 (.890-1.33)	1.96 (1.60-2.68)	3.03 (2.37-3.86)	1931
All Hispanics (2013 - 2014)	.551 (.486-.624)	.490 (.420-.580)	.910 (.820-1.10)	1.76 (1.44-2.12)	2.59 (2.06-3.14)	1481
All Hispanics (2015 - 2016)	.607 (.546-.675)	.570 (.520-.640)	1.00 (.870-1.17)	1.75 (1.38-2.33)	2.60 (1.85-3.25)	1664
Asians (2011 - 2012)	1.86 (1.58-2.19)	2.30 (1.84-2.64)	4.32 (3.71-5.21)	7.71 (6.38-8.79)	10.3 (8.85-12.0)	1005
Asians (2013 - 2014)	1.72 (1.46-2.03)	1.77 (1.42-2.26)	3.92 (3.35-4.55)	7.78 (6.39-9.16)	9.99 (9.16-13.7)	510
Asians (2015 - 2016)	1.73 (1.41-2.12)	2.03 (1.40-2.70)	4.21 (3.31-5.50)	7.66 (6.17-9.91)	11.3 (9.12-13.8)	479

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.16, 0.28, and 0.28 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Blood Inorganic Mercury (2003 – 2010)

CAS Number 92786-62-4

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	.600 (.500-.600)	.700 (.700-.700)	8147
Total population (2005 - 2006)	*	< LOD	< LOD	.540 (.500-.580)	.660 (.620-.710)	8371
Total population (2007 - 2008)	*	< LOD	.350 (<LOD-.370)	.520 (.500-.540)	.650 (.620-.690)	8162
Total population (2009 - 2010)	*	< LOD	< LOD	.390 (.360-.430)	.510 (.480-.570)	8733
Age 1-5 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.500 (<LOD-.600)	792
Age 1-5 years (2005 - 2006)	*	< LOD	< LOD	.430 (<LOD-.470)	.510 (.430-.670)	948
Age 1-5 years (2007 - 2008)	*	< LOD	< LOD	.350 (<LOD-.450)	.500 (.410-.550)	726
Age 1-5 years (2009 - 2010)	*	< LOD	< LOD	< LOD	.360 (<LOD-.460)	789
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.600 (.500-.600)	842
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	.450 (<LOD-.520)	.560 (.470-.640)	932
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	.380 (.350-.410)	.470 (.420-.520)	1010
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	.380 (.350-.440)	1006
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	.500 (<LOD-.500)	.600 (.500-.600)	2060
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.430 (.410-.460)	.540 (.480-.590)	1984
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.370 (<LOD-.400)	.480 (.410-.530)	1069
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	.420 (.350-.500)	1184
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	.600 (.500-.600)	.700 (.700-.800)	4453
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	.570 (.530-.610)	.690 (.650-.750)	4507
Age 20+ years (2007 - 2008)	*	< LOD	.380 (.360-.390)	.550 (.530-.570)	.700 (.660-.730)	5357
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	.420 (.390-.450)	.540 (.490-.600)	5754
Males (2003 - 2004)	*	< LOD	< LOD	.500 (.500-.600)	.600 (.600-.700)	4015
Males (2005 - 2006)	*	< LOD	< LOD	.480 (.450-.520)	.600 (.550-.640)	4076
Males (2007 - 2008)	*	< LOD	< LOD	.500 (.470-.520)	.600 (.570-.650)	4093
Males (2009 - 2010)	*	< LOD	< LOD	.370 (<LOD-.420)	.500 (.440-.560)	4336
Females (2003 - 2004)	*	< LOD	< LOD	.600 (.500-.600)	.700 (.700-.800)	4132
Females (2005 - 2006)	*	< LOD	< LOD	.580 (.550-.640)	.700 (.670-.780)	4295
Females (2007 - 2008)	*	< LOD	.380 (.360-.390)	.550 (.520-.570)	.700 (.670-.740)	4069
Females (2009 - 2010)	*	< LOD	< LOD	.410 (.380-.440)	.530 (.490-.600)	4397

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.42, 0.4, 0.35, and 0.35 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Blood Inorganic Mercury (2003 – 2010)

CAS Number 92786-62-4

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.500 (.500-.600)	.700 (.600-.800)	2007
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.530 (.470-.580)	.670 (.560-.830)	2224
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.430 (.400-.480)	.560 (.520-.610)	1685
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	.470 (.390-.530)	1947
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	.600 (.500-.600)	.700 (.600-.800)	2240
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	.530 (.470-.600)	.670 (.600-.760)	2183
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.490 (.450-.530)	.610 (.560-.650)	1729
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.370 (.350-.390)	.480 (.410-.530)	1580
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	.600 (.500-.600)	.700 (.600-.700)	3406
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	.540 (.500-.580)	.650 (.610-.710)	3298
Non-Hispanic whites (2007 - 2008)	*	< LOD	.360 (<LOD-.390)	.530 (.500-.550)	.660 (.620-.700)	3421
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.410 (.370-.450)	.520 (.480-.590)	3739

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.42, 0.4, 0.35, and 0.35 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Blood Inorganic Mercury (2011 – 2016)

CAS Number 92786-62-4

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	.440 (.390-.480)	.600 (.520-.680)	7841
Total population (2013 - 2014)	*	< LOD	< LOD	.410 (.380-.440)	.530 (.490-.570)	5175
Total population (2015 - 2016)	*	< LOD	< LOD	.350 (.300-.400)	.480 (.430-.530)	4938
Age 1-5 years (2011 - 2012)	*	< LOD	< LOD	< LOD	.280 (<LOD-.360)	657
Age 1-5 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	779
Age 1-5 years (2015 - 2016)	*	< LOD	< LOD	< LOD	.270 (<LOD-.340)	749
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	.280 (<LOD-.320)	.360 (.290-.450)	1044
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.340 (<LOD-.420)	1074
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	< LOD	.330 (<LOD-.450)	1022
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	.280 (<LOD-.350)	.400 (.300-.540)	1121
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.360 (.290-.420)	627
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	.400 (<LOD-.510)	565
Age 20+ years (2011 - 2012)	*	< LOD	.290 (.270-.310)	.470 (.420-.530)	.630 (.550-.760)	5019
Age 20+ years (2013 - 2014)	*	< LOD	.270 (<LOD-.300)	.440 (.410-.470)	.560 (.510-.660)	2695
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	.380 (.330-.430)	.500 (.450-.560)	2602
Males (2011 - 2012)	*	< LOD	< LOD	.420 (.370-.480)	.600 (.490-.680)	3925
Males (2013 - 2014)	*	< LOD	< LOD	.400 (.340-.430)	.510 (.450-.560)	2570
Males (2015 - 2016)	*	< LOD	< LOD	.330 (.280-.400)	.430 (.400-.490)	2460
Females (2011 - 2012)	*	< LOD	.280 (<LOD-.300)	.450 (.390-.490)	.610 (.520-.700)	3916
Females (2013 - 2014)	*	< LOD	< LOD	.420 (.390-.450)	.550 (.510-.590)	2605
Females (2015 - 2016)	*	< LOD	< LOD	.370 (.320-.450)	.530 (.450-.620)	2478
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	.390 (.330-.460)	.580 (.460-.710)	1058
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.380 (.330-.410)	.540 (.420-.640)	958
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	.420 (.290-.600)	.560 (.430-.820)	988
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	.410 (.370-.470)	.570 (.480-.670)	2170
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.380 (.330-.430)	.530 (.440-.630)	1110
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	.330 (.270-.380)	.430 (.370-.490)	1058
Non-Hispanic whites (2011 - 2012)	*	< LOD	.270 (<LOD-.300)	.430 (.370-.490)	.590 (.480-.690)	2477
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.420 (.360-.450)	.510 (.460-.570)	1835
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	.320 (.280-.400)	.460 (.400-.540)	1500
All Hispanics (2011 - 2012)	*	< LOD	< LOD	.430 (.370-.490)	.630 (.540-.760)	1902
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.380 (.330-.410)	.540 (.440-.650)	1467
All Hispanics (2015 - 2016)	*	< LOD	< LOD	.380 (.300-.490)	.510 (.430-.650)	1648
Asians (2011 - 2012)	*	< LOD	.350 (.310-.390)	.550 (.500-.590)	.700 (.630-.760)	997
Asians (2013 - 2014)	*	< LOD	.330 (.270-.390)	.570 (.420-.680)	.750 (.580-1.10)	508
Asians (2015 - 2016)	*	< LOD	< LOD	.430 (.360-.540)	.600 (.470-.730)	473

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.27, 0.27, and 0.27 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Blood Ethyl Mercury (2011 – 2016)

CAS Number 92786-62-4

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	7841
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	5175
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	4936
Age 1-5 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	657
Age 1-5 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	779
Age 1-5 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	749
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1044
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1074
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1022
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1121
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	627
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	565
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	5019
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2695
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2600
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	3925
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2570
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2458
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	3916
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2605
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2478
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1058
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	958
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	988
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2170
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1110
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1057
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2477
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1835
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1500
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1902
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1467
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1647
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	.160 (<LOD-.280)	997
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	508
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	473

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.16, 0.16, and 0.16 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Blood Methyl Mercury (2011 – 2016)

CAS Number 92786-62-4

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.498 (.423-.587)	.480 (.400-.570)	1.25 (.950-1.61)	2.81 (2.29-3.55)	4.43 (3.46-5.49)	7841
Total population (2013 - 2014)	.434 (.381-.495)	.420 (.340-.510)	1.09 (.940-1.27)	2.62 (2.18-3.04)	4.28 (3.74-4.93)	5175
Total population (2015 - 2016)	.413 (.361-.472)	.380 (.320-.490)	1.02 (.860-1.22)	2.30 (1.92-2.78)	3.92 (3.35-4.81)	4938
Age 1-5 years (2011 - 2012)	*	.140 (.120-.170)	.270 (.220-.350)	.540 (.420-.780)	.970 (.590-1.14)	657
Age 1-5 years (2013 - 2014)	*	< LOD	.260 (.230-.310)	.660 (.550-.810)	1.11 (.960-1.48)	779
Age 1-5 years (2015 - 2016)	*	< LOD	.200 (.170-.240)	.470 (.350-.630)	.830 (.590-1.21)	749
Age 6-11 years (2011 - 2012)	.209 (.182-.241)	.180 (.150-.220)	.400 (.330-.490)	.820 (.630-1.06)	1.34 (.940-1.84)	1044
Age 6-11 years (2013 - 2014)	*	.150 (<LOD-.200)	.380 (.280-.530)	.960 (.700-1.26)	1.58 (1.26-2.11)	1074
Age 6-11 years (2015 - 2016)	*	.140 (<LOD-.180)	.290 (.260-.340)	.730 (.530-.950)	1.11 (.870-1.91)	1022
Age 12-19 years (2011 - 2012)	.276 (.237-.322)	.270 (.210-.310)	.570 (.460-.670)	1.27 (.870-1.67)	2.15 (1.40-2.81)	1121
Age 12-19 years (2013 - 2014)	.233 (.202-.269)	.190 (.140-.260)	.480 (.380-.560)	1.02 (.730-1.60)	1.84 (1.20-2.57)	627
Age 12-19 years (2015 - 2016)	.212 (.180-.249)	.160 (.120-.220)	.420 (.310-.620)	.800 (.690-1.23)	1.81 (.800-3.14)	565
Age 20+ years (2011 - 2012)	.624 (.523-.746)	.610 (.500-.760)	1.53 (1.18-2.00)	3.28 (2.56-4.31)	4.97 (3.91-6.89)	5019
Age 20+ years (2013 - 2014)	.541 (.473-.618)	.540 (.450-.630)	1.32 (1.17-1.54)	3.05 (2.64-3.60)	4.92 (4.34-5.41)	2695
Age 20+ years (2015 - 2016)	.518 (.456-.588)	.530 (.420-.630)	1.23 (1.05-1.46)	2.59 (2.25-3.36)	4.42 (3.66-5.58)	2602
Males (2011 - 2012)	.509 (.433-.598)	.490 (.400-.590)	1.30 (.990-1.62)	2.84 (2.29-3.68)	4.77 (3.44-6.74)	3925
Males (2013 - 2014)	.448 (.390-.515)	.430 (.350-.530)	1.10 (.940-1.37)	2.67 (2.22-3.33)	4.44 (3.88-5.40)	2570
Males (2015 - 2016)	.429 (.379-.486)	.400 (.330-.520)	1.11 (.900-1.33)	2.24 (1.85-2.86)	4.42 (3.60-5.05)	2460
Females (2011 - 2012)	.489 (.413-.580)	.470 (.380-.560)	1.19 (.900-1.61)	2.72 (2.18-3.46)	3.99 (3.28-4.99)	3916
Females (2013 - 2014)	.422 (.367-.485)	.400 (.330-.490)	1.08 (.900-1.22)	2.46 (2.03-2.92)	3.91 (3.32-4.93)	2605
Females (2015 - 2016)	.399 (.338-.470)	.370 (.300-.470)	.950 (.760-1.18)	2.36 (1.91-2.81)	3.58 (2.92-4.24)	2478
Mexican Americans (2011 - 2012)	.320 (.264-.387)	.330 (.260-.410)	.610 (.500-.770)	1.23 (.920-1.40)	1.66 (1.33-2.06)	1058
Mexican Americans (2013 - 2014)	.276 (.239-.318)	.260 (.210-.310)	.540 (.440-.650)	1.06 (.770-1.43)	1.72 (1.27-2.34)	958
Mexican Americans (2015 - 2016)	.292 (.276-.309)	.290 (.260-.330)	.610 (.550-.690)	1.13 (.870-1.47)	1.54 (1.34-2.02)	988
Non-Hispanic blacks (2011 - 2012)	.517 (.392-.681)	.510 (.380-.660)	1.13 (.750-1.61)	2.37 (1.66-3.08)	3.63 (2.57-5.16)	2170
Non-Hispanic blacks (2013 - 2014)	.481 (.407-.569)	.460 (.370-.580)	1.03 (.900-1.22)	2.08 (1.55-2.72)	3.33 (2.15-5.12)	1110
Non-Hispanic blacks (2015 - 2016)	.461 (.376-.565)	.430 (.330-.580)	1.05 (.830-1.25)	2.34 (1.71-3.31)	4.08 (2.80-5.58)	1058
Non-Hispanic whites (2011 - 2012)	.478 (.392-.583)	.470 (.360-.580)	1.25 (.870-1.69)	2.76 (2.06-3.69)	4.24 (2.92-6.38)	2477
Non-Hispanic whites (2013 - 2014)	.420 (.357-.495)	.420 (.310-.530)	1.10 (.910-1.32)	2.62 (2.07-3.12)	4.01 (3.46-5.00)	1835
Non-Hispanic whites (2015 - 2016)	.380 (.319-.451)	.350 (.270-.490)	.960 (.750-1.22)	2.04 (1.55-2.51)	3.50 (2.32-4.49)	1500
All Hispanics (2011 - 2012)	.429 (.350-.525)	.420 (.340-.520)	.890 (.700-1.17)	1.81 (1.39-2.46)	2.94 (2.19-3.71)	1902
All Hispanics (2013 - 2014)	.326 (.278-.382)	.310 (.250-.350)	.680 (.580-.790)	1.50 (1.15-1.89)	2.34 (1.79-3.00)	1467
All Hispanics (2015 - 2016)	.353 (.305-.409)	.350 (.300-.390)	.760 (.630-.930)	1.53 (1.14-1.98)	2.26 (1.60-3.03)	1648
Asians (2011 - 2012)	1.58 (1.29-1.94)	2.16 (1.68-2.55)	4.35 (3.64-5.13)	7.57 (6.21-8.61)	10.5 (8.48-12.5)	997
Asians (2013 - 2014)	1.42 (1.16-1.74)	1.71 (1.17-2.07)	3.90 (3.31-4.54)	7.93 (6.42-9.21)	10.8 (9.57-13.6)	508
Asians (2015 - 2016)	1.37 (1.08-1.73)	1.85 (1.18-2.51)	3.80 (3.11-4.83)	7.52 (5.60-9.63)	11.0 (8.65-12.4)	473

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.12, 0.12, and 0.12 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Urinary Mercury (2003 – 2010)

CAS Number 92786-62-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	.447 (.406-.492)	.420 (.360-.480)	1.00 (.870-1.14)	2.08 (1.78-2.42)	3.19 (2.76-3.55)	2538
Total population (2005 - 2006)	.468 (.426-.514)	.460 (.410-.510)	1.03 (.900-1.12)	2.11 (1.88-2.36)	2.94 (2.58-3.26)	2578
Total population (2007 - 2008)	.443 (.408-.482)	.440 (.400-.470)	.880 (.760-1.00)	1.74 (1.62-1.96)	2.66 (2.29-3.08)	2634
Total population (2009 - 2010)	*	.400 (.360-.450)	.850 (.770-.910)	1.53 (1.30-1.81)	2.42 (2.07-2.72)	2865
Age 6-11 years (2003 - 2004)	.254 (.213-.304)	.200 (.160-.250)	.440 (.330-.580)	1.16 (.610-1.61)	1.96 (1.13-2.97)	287
Age 6-11 years (2005 - 2006)	.333 (.267-.416)	.320 (.250-.390)	.650 (.470-.840)	1.32 (.930-1.88)	2.18 (1.28-3.40)	355
Age 6-11 years (2007 - 2008)	.301 (.260-.347)	.290 (.230-.340)	.520 (.430-.620)	1.03 (.770-1.23)	1.87 (1.03-3.48)	398
Age 6-11 years (2009 - 2010)	*	.260 (.220-.320)	.510 (.430-.620)	1.03 (.730-1.31)	1.58 (1.18-1.88)	379
Age 12-19 years (2003 - 2004)	.358 (.313-.408)	.330 (.290-.370)	.700 (.530-.840)	1.60 (1.14-2.52)	2.93 (1.88-3.66)	722
Age 12-19 years (2005 - 2006)	.372 (.286-.486)	.350 (.270-.470)	.740 (.580-.920)	1.61 (.970-2.81)	2.59 (1.40-4.45)	703
Age 12-19 years (2007 - 2008)	.364 (.326-.406)	.380 (.320-.450)	.590 (.550-.650)	1.24 (.830-1.71)	1.82 (1.41-2.29)	375
Age 12-19 years (2009 - 2010)	*	.290 (.230-.360)	.530 (.470-.630)	1.09 (.890-1.31)	1.73 (1.28-2.31)	455
Age 20+ years (2003 - 2004)	.495 (.442-.555)	.480 (.410-.570)	1.12 (.930-1.29)	2.20 (1.85-2.65)	3.33 (2.76-3.88)	1529
Age 20+ years (2005 - 2006)	.505 (.468-.545)	.510 (.460-.560)	1.11 (1.04-1.16)	2.23 (1.97-2.50)	3.11 (2.64-3.37)	1520
Age 20+ years (2007 - 2008)	.477 (.435-.523)	.470 (.430-.520)	.970 (.850-1.10)	1.89 (1.69-2.20)	2.82 (2.33-3.56)	1861
Age 20+ years (2009 - 2010)	*	.450 (.390-.510)	.890 (.810-1.00)	1.66 (1.40-2.01)	2.53 (2.21-2.84)	2031
Males (2003 - 2004)	.433 (.405-.463)	.400 (.350-.460)	.940 (.840-1.05)	1.88 (1.63-2.18)	2.68 (2.34-3.05)	1266
Males (2005 - 2006)	.464 (.411-.523)	.450 (.400-.520)	.980 (.860-1.11)	2.03 (1.57-2.48)	3.00 (2.48-3.37)	1270
Males (2007 - 2008)	.457 (.417-.501)	.460 (.400-.520)	.880 (.780-1.01)	1.68 (1.53-1.77)	2.40 (2.11-2.76)	1326
Males (2009 - 2010)	*	.410 (.340-.480)	.860 (.750-.950)	1.46 (1.29-1.66)	2.21 (1.93-2.53)	1404
Females (2003 - 2004)	.460 (.396-.534)	.430 (.330-.530)	1.07 (.870-1.28)	2.26 (1.77-2.90)	3.54 (2.76-4.31)	1272
Females (2005 - 2006)	.472 (.424-.525)	.470 (.390-.550)	1.07 (.900-1.19)	2.14 (1.84-2.50)	2.89 (2.60-3.38)	1308
Females (2007 - 2008)	.431 (.388-.478)	.430 (.380-.460)	.870 (.710-1.05)	1.88 (1.55-2.38)	2.92 (2.27-4.17)	1308
Females (2009 - 2010)	*	.390 (.360-.450)	.840 (.730-.940)	1.61 (1.29-2.03)	2.61 (2.16-3.12)	1461
Mexican Americans (2003 - 2004)	.416 (.340-.509)	.360 (.280-.430)	.960 (.700-1.23)	2.19 (1.39-3.24)	3.16 (1.99-6.30)	619
Mexican Americans (2005 - 2006)	.451 (.369-.551)	.420 (.310-.560)	1.01 (.780-1.25)	2.22 (1.48-2.64)	3.00 (2.27-4.01)	651
Mexican Americans (2007 - 2008)	.409 (.349-.480)	.370 (.330-.450)	.780 (.700-.950)	1.82 (1.26-1.97)	2.55 (1.87-3.08)	514
Mexican Americans (2009 - 2010)	*	.350 (.280-.430)	.670 (.520-.890)	1.53 (1.06-1.84)	2.29 (1.81-2.76)	615
Non-Hispanic blacks (2003 - 2004)	.476 (.413-.549)	.430 (.360-.530)	.890 (.770-1.00)	1.96 (1.60-2.31)	3.09 (2.03-4.89)	713
Non-Hispanic blacks (2005 - 2006)	.453 (.384-.533)	.450 (.380-.550)	.890 (.710-1.13)	1.78 (1.34-2.29)	2.57 (2.21-3.15)	691
Non-Hispanic blacks (2007 - 2008)	.478 (.411-.556)	.460 (.380-.540)	.910 (.770-1.06)	1.85 (1.42-2.41)	2.76 (1.97-4.19)	589
Non-Hispanic blacks (2009 - 2010)	*	.410 (.340-.490)	.840 (.650-1.08)	1.66 (1.34-1.95)	2.64 (1.88-3.30)	546
Non-Hispanic whites (2003 - 2004)	.441 (.382-.509)	.420 (.330-.520)	1.01 (.840-1.23)	2.08 (1.67-2.46)	3.24 (2.67-3.60)	1066
Non-Hispanic whites (2005 - 2006)	.459 (.409-.513)	.440 (.400-.510)	1.00 (.860-1.12)	2.07 (1.77-2.40)	2.81 (2.47-3.37)	1044
Non-Hispanic whites (2007 - 2008)	.431 (.378-.493)	.430 (.380-.480)	.880 (.700-1.07)	1.71 (1.50-2.18)	2.70 (2.18-3.59)	1100
Non-Hispanic whites (2009 - 2010)	*	.390 (.330-.470)	.850 (.750-.950)	1.52 (1.26-2.01)	2.42 (1.93-2.85)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.14, 0.11, 0.08, and 0.08 respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Urinary Mercury (2011 – 2016)

CAS Number 92786-62-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.324 (.285-.368)	.320 (.280-.370)	.660 (.580-.770)	1.37 (1.15-1.59)	1.83 (1.62-2.14)	2507
Total population (2013 - 2014)	.246 (.221-.273)	.200 (.170-.240)	.470 (.400-.570)	1.07 (.900-1.22)	1.64 (1.35-1.96)	2666
Total population (2015 - 2016)	*	< LOD	.280 (.250-.320)	.680 (.570-.780)	1.18 (.920-1.29)	3080
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	.160 (<LOD-.240)	.280 (.190-.510)	496
Age 6-11 years (2011 - 2012)	.241 (.206-.283)	.220 (.190-.270)	.450 (.390-.530)	.930 (.680-1.36)	1.37 (.990-2.03)	401
Age 6-11 years (2013 - 2014)	*	< LOD	.220 (.150-.310)	.560 (.340-.840)	.890 (.640-1.10)	401
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	.300 (.200-.380)	.520 (.360-.700)	380
Age 12-19 years (2011 - 2012)	.257 (.212-.312)	.270 (.220-.340)	.490 (.390-.600)	.840 (.650-1.24)	1.31 (.920-1.75)	390
Age 12-19 years (2013 - 2014)	*	< LOD	.240 (.200-.310)	.560 (.400-.860)	1.02 (.610-1.81)	452
Age 12-19 years (2015 - 2016)	*	< LOD	.130 (<LOD-.160)	.350 (.200-.470)	.610 (.380-1.14)	402
Age 20+ years (2011 - 2012)	.346 (.303-.396)	.340 (.290-.400)	.720 (.620-.850)	1.49 (1.20-1.67)	1.93 (1.67-2.29)	1716
Age 20+ years (2013 - 2014)	.274 (.246-.305)	.240 (.200-.280)	.540 (.450-.630)	1.16 (1.00-1.33)	1.76 (1.44-2.04)	1813
Age 20+ years (2015 - 2016)	*	.140 (.130-.150)	.340 (.310-.380)	.740 (.650-.890)	1.22 (.970-1.43)	1802
Males (2011 - 2012)	.342 (.293-.399)	.330 (.290-.380)	.670 (.580-.810)	1.34 (1.03-1.67)	1.91 (1.54-2.51)	1260
Males (2013 - 2014)	.243 (.219-.268)	.200 (.170-.220)	.480 (.390-.600)	1.07 (.840-1.33)	1.55 (1.28-1.96)	1319
Males (2015 - 2016)	*	< LOD	.280 (.230-.330)	.620 (.540-.710)	.900 (.760-1.18)	1533
Females (2011 - 2012)	.307 (.262-.360)	.300 (.250-.360)	.660 (.540-.770)	1.37 (1.17-1.54)	1.82 (1.54-2.14)	1247
Females (2013 - 2014)	.249 (.218-.284)	.210 (.170-.260)	.470 (.390-.570)	1.07 (.820-1.27)	1.75 (1.25-2.26)	1347
Females (2015 - 2016)	*	< LOD	.290 (.250-.350)	.730 (.570-.980)	1.27 (.940-1.88)	1547
Mexican Americans (2011 - 2012)	.301 (.261-.348)	.300 (.200-.400)	.620 (.510-.680)	1.25 (.910-1.53)	1.75 (1.32-2.25)	317
Mexican Americans (2013 - 2014)	.229 (.198-.265)	.160 (.150-.210)	.450 (.300-.620)	1.12 (.780-1.35)	1.47 (.970-2.38)	454
Mexican Americans (2015 - 2016)	*	< LOD	.230 (.170-.280)	.530 (.440-.640)	.900 (.650-1.22)	586
Non-Hispanic blacks (2011 - 2012)	.360 (.316-.410)	.360 (.320-.400)	.670 (.570-.800)	1.33 (1.06-1.60)	1.99 (1.48-3.06)	671
Non-Hispanic blacks (2013 - 2014)	.279 (.228-.340)	.250 (.190-.320)	.530 (.400-.690)	1.10 (.900-1.49)	1.82 (1.11-2.48)	580
Non-Hispanic blacks (2015 - 2016)	*	.140 (<LOD-.180)	.370 (.270-.510)	.800 (.620-1.19)	1.38 (.870-1.72)	676
Non-Hispanic whites (2011 - 2012)	.308 (.260-.365)	.290 (.260-.360)	.630 (.510-.810)	1.37 (1.09-1.64)	1.77 (1.49-2.14)	819
Non-Hispanic whites (2013 - 2014)	.240 (.211-.271)	.200 (.160-.230)	.460 (.370-.580)	1.06 (.840-1.24)	1.64 (1.24-2.04)	988
Non-Hispanic whites (2015 - 2016)	*	< LOD	.260 (.210-.330)	.700 (.480-.870)	1.18 (.860-1.40)	932
All Hispanics (2011 - 2012)	.330 (.299-.364)	.330 (.270-.390)	.680 (.610-.760)	1.30 (1.15-1.53)	1.98 (1.61-2.42)	574
All Hispanics (2013 - 2014)	.239 (.207-.276)	.180 (.150-.240)	.460 (.360-.620)	1.14 (.800-1.35)	1.57 (1.24-2.15)	702
All Hispanics (2015 - 2016)	*	< LOD	.260 (.210-.330)	.600 (.470-.740)	1.03 (.730-1.37)	986
Asians (2011 - 2012)	.430 (.351-.527)	.450 (.330-.580)	.910 (.750-1.12)	1.69 (1.31-2.06)	2.41 (1.77-3.53)	355
Asians (2013 - 2014)	.313 (.269-.363)	.270 (.220-.340)	.620 (.520-.710)	1.18 (.890-1.66)	1.78 (1.20-3.10)	291
Asians (2015 - 2016)	*	.180 (<LOD-.250)	.390 (.330-.510)	.720 (.610-.820)	.960 (.790-1.49)	333

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.05, 0.13, and 0.13, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Urinary Mercury (creatinine corrected) (2003 – 2010)

CAS Number 92786-62-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	.443 (.404-.486)	.447 (.392-.498)	.909 (.785-1.00)	1.65 (1.40-1.86)	2.35 (1.88-2.85)	2537
Total population (2005 - 2006)	.460 (.414-.511)	.450 (.410-.510)	.870 (.790-1.00)	1.63 (1.44-1.75)	2.26 (2.12-2.50)	2578
Total population (2007 - 2008)	.462 (.425-.502)	.450 (.400-.490)	.820 (.750-.960)	1.57 (1.38-1.73)	2.32 (2.00-2.89)	2634
Total population (2009 - 2010)	*	.409 (.367-.459)	.793 (.691-.893)	1.43 (1.24-1.67)	2.09 (1.79-2.39)	2865
Age 6-11 years (2003 - 2004)	.297 (.246-.358)	.276 (.208-.347)	.485 (.391-.630)	1.25 (.667-1.79)	1.79 (1.11-2.61)	286
Age 6-11 years (2005 - 2006)	.411 (.323-.524)	.390 (.290-.500)	.710 (.510-.960)	1.30 (.990-2.12)	2.55 (1.38-3.50)	355
Age 6-11 years (2007 - 2008)	.393 (.351-.440)	.350 (.300-.440)	.630 (.540-.770)	1.15 (.860-1.50)	1.68 (1.18-2.99)	398
Age 6-11 years (2009 - 2010)	*	.357 (.306-.406)	.632 (.500-.750)	1.04 (.863-1.26)	1.62 (1.19-1.98)	379
Age 12-19 years (2003 - 2004)	.255 (.225-.289)	.217 (.196-.275)	.464 (.376-.535)	1.06 (.714-1.39)	1.67 (1.13-2.03)	722
Age 12-19 years (2005 - 2006)	.286 (.230-.356)	.260 (.200-.320)	.500 (.380-.660)	1.09 (.660-1.70)	1.76 (1.11-2.67)	703
Age 12-19 years (2007 - 2008)	.284 (.251-.320)	.280 (.230-.300)	.500 (.400-.550)	.890 (.620-1.08)	1.18 (.980-1.36)	375
Age 12-19 years (2009 - 2010)	*	.226 (.202-.287)	.481 (.429-.553)	.917 (.736-1.18)	1.41 (1.12-1.62)	455
Age 20+ years (2003 - 2004)	.508 (.455-.566)	.525 (.447-.616)	1.00 (.875-1.09)	1.76 (1.46-2.11)	2.54 (2.04-3.00)	1529
Age 20+ years (2005 - 2006)	.503 (.461-.549)	.510 (.470-.550)	.940 (.850-1.07)	1.69 (1.50-1.86)	2.31 (2.12-2.54)	1520
Age 20+ years (2007 - 2008)	.507 (.463-.555)	.500 (.450-.550)	.940 (.810-1.02)	1.69 (1.51-2.01)	2.56 (2.09-3.17)	1861
Age 20+ years (2009 - 2010)	*	.454 (.395-.517)	.861 (.731-.988)	1.51 (1.29-1.85)	2.15 (1.88-2.57)	2031
Males (2003 - 2004)	.365 (.333-.400)	.362 (.309-.417)	.696 (.620-.784)	1.31 (1.18-1.44)	1.87 (1.51-2.30)	1266
Males (2005 - 2006)	.380 (.336-.431)	.390 (.330-.440)	.740 (.600-.890)	1.27 (1.09-1.47)	1.73 (1.62-1.85)	1270
Males (2007 - 2008)	.408 (.374-.445)	.390 (.350-.450)	.730 (.650-.810)	1.22 (1.11-1.36)	1.69 (1.54-2.11)	1326
Males (2009 - 2010)	*	.337 (.298-.391)	.675 (.585-.802)	1.19 (1.06-1.29)	1.50 (1.33-1.78)	1404
Females (2003 - 2004)	.532 (.472-.599)	.545 (.455-.652)	1.06 (.969-1.21)	1.88 (1.64-2.30)	2.77 (2.12-3.56)	1271
Females (2005 - 2006)	.552 (.494-.617)	.540 (.490-.620)	1.09 (.850-1.27)	1.96 (1.72-2.14)	2.78 (2.35-3.17)	1308
Females (2007 - 2008)	.520 (.469-.576)	.490 (.460-.540)	.960 (.820-1.11)	1.92 (1.58-2.24)	2.83 (2.24-3.50)	1308
Females (2009 - 2010)	*	.475 (.423-.552)	.890 (.771-1.07)	1.81 (1.43-2.09)	2.57 (2.09-2.94)	1461
Mexican Americans (2003 - 2004)	.384 (.307-.480)	.365 (.280-.455)	.768 (.619-.990)	1.62 (1.23-2.16)	2.32 (1.78-4.01)	618
Mexican Americans (2005 - 2006)	.425 (.337-.536)	.400 (.310-.490)	.840 (.560-1.29)	1.82 (1.30-2.47)	2.63 (2.22-3.20)	651
Mexican Americans (2007 - 2008)	.409 (.350-.479)	.380 (.310-.480)	.790 (.690-.850)	1.55 (1.08-1.98)	2.03 (1.55-2.70)	514
Mexican Americans (2009 - 2010)	*	.333 (.272-.400)	.660 (.494-.861)	1.29 (1.02-1.54)	1.95 (1.52-2.89)	615
Non-Hispanic blacks (2003 - 2004)	.343 (.301-.391)	.306 (.265-.368)	.587 (.522-.687)	1.28 (.964-1.63)	2.13 (1.41-2.87)	713
Non-Hispanic blacks (2005 - 2006)	.328 (.285-.378)	.320 (.270-.370)	.610 (.470-.780)	1.15 (.930-1.40)	1.64 (1.29-1.96)	691
Non-Hispanic blacks (2007 - 2008)	.350 (.303-.404)	.330 (.280-.380)	.590 (.490-.690)	1.10 (.840-1.46)	1.85 (1.13-2.77)	589
Non-Hispanic blacks (2009 - 2010)	*	.317 (.259-.393)	.582 (.500-.659)	1.05 (.900-1.30)	1.55 (1.18-1.96)	546
Non-Hispanic whites (2003 - 2004)	.463 (.400-.537)	.476 (.385-.588)	.970 (.800-1.07)	1.67 (1.32-2.11)	2.40 (1.88-2.90)	1066
Non-Hispanic whites (2005 - 2006)	.475 (.426-.531)	.490 (.440-.540)	.890 (.820-1.02)	1.61 (1.42-1.75)	2.23 (1.98-2.50)	1044
Non-Hispanic whites (2007 - 2008)	.481 (.423-.546)	.480 (.390-.540)	.890 (.750-1.03)	1.58 (1.34-2.02)	2.49 (1.89-3.18)	1100
Non-Hispanic whites (2009 - 2010)	*	.434 (.370-.500)	.833 (.689-1.04)	1.50 (1.26-1.87)	2.12 (1.80-2.64)	1225

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Urinary Mercury (creatinine corrected) (2011 – 2016)

CAS Number 92786-62-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.367 (.333-.405)	.353 (.306-.394)	.676 (.623-.754)	1.33 (1.13-1.50)	1.75 (1.49-2.32)	2505
Total population (2013 - 2014)	.283 (.260-.309)	.270 (.250-.290)	.571 (.511-.644)	1.20 (1.05-1.36)	1.61 (1.47-1.81)	2665
Total population (2015 - 2016)	*	< LOD	.356 (.318-.391)	.708 (.628-.817)	1.10 (.912-1.25)	3077
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	.667 (<LOD-.818)	.994 (.818-1.13)	495
Age 6-11 years (2011 - 2012)	.345 (.298-.398)	.306 (.276-.344)	.537 (.441-.613)	1.08 (.884-1.43)	1.62 (1.07-2.34)	400
Age 6-11 years (2013 - 2014)	*	< LOD	.429 (.310-.529)	.750 (.563-.897)	1.11 (.713-1.72)	401
Age 6-11 years (2015 - 2016)	*	< LOD	< LOD	.474 (.409-.529)	.643 (.500-1.00)	380
Age 12-19 years (2011 - 2012)	.246 (.219-.277)	.221 (.190-.269)	.405 (.368-.453)	.735 (.571-1.11)	1.21 (.742-1.49)	390
Age 12-19 years (2013 - 2014)	*	< LOD	.257 (.200-.281)	.580 (.391-.735)	.846 (.580-1.07)	452
Age 12-19 years (2015 - 2016)	*	< LOD	.194 (<LOD-.220)	.320 (.246-.568)	.650 (.385-.967)	402
Age 20+ years (2011 - 2012)	.393 (.351-.439)	.383 (.330-.437)	.750 (.673-.805)	1.38 (1.17-1.63)	1.95 (1.50-2.48)	1715
Age 20+ years (2013 - 2014)	.318 (.291-.349)	.304 (.281-.333)	.644 (.561-.741)	1.32 (1.13-1.47)	1.76 (1.50-1.88)	1812
Age 20+ years (2015 - 2016)	*	.198 (.184-.210)	.391 (.349-.449)	.776 (.692-.886)	1.15 (1.00-1.32)	1800
Males (2011 - 2012)	.320 (.278-.368)	.294 (.267-.358)	.558 (.478-.667)	1.11 (.791-1.44)	1.57 (1.21-2.00)	1259
Males (2013 - 2014)	.242 (.223-.263)	.231 (.206-.259)	.476 (.429-.542)	.902 (.779-1.11)	1.31 (1.13-1.49)	1318
Males (2015 - 2016)	*	< LOD	.274 (.246-.300)	.563 (.490-.628)	.818 (.705-.994)	1533
Females (2011 - 2012)	.418 (.374-.466)	.409 (.355-.453)	.800 (.706-.900)	1.46 (1.29-1.65)	2.00 (1.63-2.60)	1246
Females (2013 - 2014)	.330 (.297-.367)	.315 (.273-.356)	.692 (.600-.822)	1.44 (1.18-1.68)	1.83 (1.60-2.12)	1347
Females (2015 - 2016)	*	< LOD	.415 (.375-.473)	.875 (.750-1.00)	1.30 (1.06-1.86)	1544
Mexican Americans (2011 - 2012)	.339 (.288-.399)	.286 (.225-.393)	.641 (.433-.789)	1.17 (1.00-1.42)	1.70 (1.31-2.24)	317
Mexican Americans (2013 - 2014)	.261 (.231-.295)	.237 (.209-.273)	.516 (.409-.709)	1.04 (.810-1.48)	1.62 (1.11-2.55)	454
Mexican Americans (2015 - 2016)	*	< LOD	.283 (.236-.360)	.692 (.530-.810)	1.04 (.791-1.30)	585
Non-Hispanic blacks (2011 - 2012)	.280 (.245-.320)	.261 (.224-.294)	.467 (.411-.529)	.896 (.638-1.14)	1.43 (1.10-1.57)	671
Non-Hispanic blacks (2013 - 2014)	.211 (.169-.264)	.202 (.152-.269)	.409 (.333-.516)	.794 (.643-1.10)	1.34 (.880-1.52)	580
Non-Hispanic blacks (2015 - 2016)	*	.136 (<LOD-.163)	.303 (.237-.367)	.642 (.450-.848)	.901 (.695-1.18)	674
Non-Hispanic whites (2011 - 2012)	.372 (.323-.428)	.364 (.294-.433)	.700 (.619-.805)	1.35 (1.05-1.63)	1.75 (1.41-2.48)	817
Non-Hispanic whites (2013 - 2014)	.295 (.269-.323)	.278 (.257-.310)	.602 (.516-.689)	1.27 (1.08-1.45)	1.64 (1.46-1.82)	987
Non-Hispanic whites (2015 - 2016)	*	< LOD	.349 (.300-.400)	.708 (.563-.886)	1.10 (.827-1.32)	932
All Hispanics (2011 - 2012)	.369 (.342-.399)	.331 (.283-.384)	.674 (.612-.772)	1.24 (1.13-1.44)	1.86 (1.47-2.92)	574
All Hispanics (2013 - 2014)	.267 (.237-.300)	.237 (.214-.273)	.541 (.448-.634)	1.07 (.837-1.36)	1.61 (1.24-1.86)	702
All Hispanics (2015 - 2016)	*	< LOD	.348 (.284-.408)	.717 (.574-.917)	1.15 (.948-1.36)	985
Asians (2011 - 2012)	.577 (.473-.705)	.562 (.467-.700)	1.16 (.872-1.44)	1.82 (1.54-2.00)	2.29 (1.90-3.12)	355
Asians (2013 - 2014)	.488 (.422-.565)	.475 (.373-.600)	.917 (.779-1.06)	1.88 (1.35-2.19)	2.57 (1.88-4.24)	291
Asians (2015 - 2016)	*	.290 (<LOD-.375)	.594 (.457-.706)	1.02 (.808-1.22)	1.38 (1.11-1.80)	333

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Mercury_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Mercury_FactSheet.html

Urinary Molybdenum (1999 – 2010)

CAS Number 7439-98-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	45.9 (40.1-52.6)	50.7 (44.6-58.4)	84.9 (78.7-92.3)	135 (125-146)	180 (154-216)	2257
Total population (2001 - 2002)	45.0 (42.1-48.0)	52.4 (48.9-55.5)	83.4 (79.1-88.7)	124 (117-130)	165 (145-176)	2690
Total population (2003 - 2004)	39.7 (37.7-41.7)	44.5 (41.6-46.7)	78.5 (74.9-82.3)	111 (105-118)	138 (133-146)	2558
Total population (2005 - 2006)	45.0 (42.4-47.8)	51.0 (47.2-54.7)	81.5 (77.4-85.8)	127 (117-132)	158 (144-174)	2576
Total population (2007 - 2008)	45.2 (43.1-47.3)	49.7 (47.4-52.0)	86.2 (82.3-89.3)	136 (128-142)	163 (154-171)	2627
Total population (2009 - 2010)	42.7 (40.8-44.7)	45.2 (43.6-47.3)	79.9 (75.9-83.0)	121 (112-130)	160 (147-180)	2848
Age 6-11 years (1999 - 2000)	78.2 (61.0-100)	84.8 (67.7-105)	126 (106-147)	178 (147-259)	267 (159-840)	310
Age 6-11 years (2001 - 2002)	63.3 (53.4-75.0)	69.2 (63.0-77.6)	109 (94.5-124)	169 (138-197)	197 (161-291)	368
Age 6-11 years (2003 - 2004)	62.2 (56.7-68.3)	71.3 (55.7-84.1)	108 (92.7-122)	138 (127-152)	181 (138-235)	290
Age 6-11 years (2005 - 2006)	65.6 (56.6-76.0)	73.5 (62.8-85.5)	108 (98.6-115)	154 (130-176)	181 (154-205)	355
Age 6-11 years (2007 - 2008)	69.3 (60.8-79.0)	72.8 (62.1-83.9)	123 (99.9-148)	169 (154-217)	235 (169-282)	394
Age 6-11 years (2009 - 2010)	65.0 (57.8-73.2)	69.7 (61.1-84.2)	123 (103-138)	180 (146-205)	218 (180-263)	378
Age 12-19 years (1999 - 2000)	54.3 (47.6-62.0)	60.6 (52.2-70.3)	93.3 (79.9-109)	146 (112-171)	188 (146-216)	648
Age 12-19 years (2001 - 2002)	60.6 (55.5-66.2)	65.7 (58.7-73.1)	97.1 (91.8-108)	145 (129-159)	179 (155-227)	762
Age 12-19 years (2003 - 2004)	52.5 (49.0-56.3)	59.6 (55.5-65.1)	87.3 (84.5-91.4)	118 (105-125)	143 (130-156)	725
Age 12-19 years (2005 - 2006)	59.1 (53.7-65.1)	63.8 (57.9-69.4)	96.6 (86.3-103)	136 (127-147)	173 (148-202)	701
Age 12-19 years (2007 - 2008)	64.1 (58.6-70.2)	68.6 (63.7-80.2)	107 (97.2-118)	149 (125-167)	174 (151-196)	376
Age 12-19 years (2009 - 2010)	52.4 (47.5-57.7)	58.5 (51.4-65.6)	96.2 (85.0-104)	148 (120-170)	178 (151-201)	451
Age 20+ years (1999 - 2000)	41.7 (36.7-47.4)	46.6 (40.5-52.5)	76.7 (73.4-82.2)	126 (114-134)	168 (143-206)	1299
Age 20+ years (2001 - 2002)	41.1 (38.3-44.1)	47.6 (43.7-51.2)	79.1 (71.9-83.6)	114 (103-124)	150 (130-166)	1560
Age 20+ years (2003 - 2004)	35.9 (34.0-38.0)	40.3 (37.6-42.1)	71.5 (67.3-75.2)	105 (98.6-111)	133 (119-144)	1543
Age 20+ years (2005 - 2006)	41.3 (38.7-44.0)	46.0 (41.7-49.6)	75.7 (72.1-80.3)	116 (107-127)	153 (135-171)	1520
Age 20+ years (2007 - 2008)	40.8 (38.7-43.0)	44.5 (42.2-47.8)	77.7 (74.1-81.2)	123 (114-135)	152 (145-164)	1857
Age 20+ years (2009 - 2010)	39.6 (37.5-41.8)	42.0 (39.8-43.9)	73.5 (69.0-76.8)	107 (100-113)	144 (130-163)	2019
Males (1999 - 2000)	52.7 (45.7-60.7)	57.5 (48.5-68.4)	93.2 (83.8-106)	150 (128-187)	215 (161-278)	1121
Males (2001 - 2002)	51.0 (46.6-55.7)	56.9 (52.0-62.6)	88.5 (81.6-96.5)	130 (120-141)	169 (145-194)	1335
Males (2003 - 2004)	45.5 (43.3-47.8)	51.0 (48.1-55.4)	85.8 (82.8-90.7)	119 (112-130)	148 (136-163)	1281
Males (2005 - 2006)	50.9 (48.2-53.9)	56.0 (51.0-60.3)	85.7 (80.3-92.8)	130 (122-136)	161 (145-177)	1271
Males (2007 - 2008)	50.6 (48.1-53.2)	56.7 (52.4-60.6)	93.6 (88.7-98.7)	148 (137-150)	171 (159-178)	1327
Males (2009 - 2010)	46.2 (43.5-49.1)	50.2 (46.4-52.7)	81.8 (77.0-85.9)	127 (113-144)	169 (147-197)	1398
Females (1999 - 2000)	40.4 (34.8-46.8)	45.6 (40.4-52.0)	77.3 (71.0-85.7)	119 (105-138)	154 (132-180)	1136
Females (2001 - 2002)	39.9 (37.2-42.9)	45.8 (42.8-49.3)	78.4 (72.6-82.9)	115 (104-128)	158 (130-177)	1355
Females (2003 - 2004)	34.9 (32.2-37.7)	37.9 (33.5-41.6)	67.3 (64.6-72.2)	101 (97.3-108)	127 (114-139)	1277
Females (2005 - 2006)	40.0 (36.4-43.8)	45.6 (40.0-51.0)	75.6 (71.2-82.0)	118 (107-128)	154 (136-179)	1305
Females (2007 - 2008)	40.5 (38.1-43.0)	43.5 (39.0-48.0)	77.0 (72.0-84.5)	123 (114-134)	152 (142-165)	1300
Females (2009 - 2010)	39.6 (36.9-42.4)	41.4 (39.0-43.8)	76.8 (70.7-82.0)	114 (106-127)	151 (135-170)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.8, 0.8, 1.5, 0.92, 0.92, and 0.92 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Molybdenum_BiomonitoringSummary.html

Urinary Molybdenum (1999 – 2010)

CAS Number 7439-98-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	47.0 (42.1-52.4)	53.2 (49.2-59.0)	80.6 (73.7-91.7)	121 (103-139)	152 (120-217)	780
Mexican Americans (2001 - 2002)	49.3 (46.5-52.3)	55.7 (50.4-61.0)	86.4 (80.8-94.1)	133 (113-155)	177 (142-207)	683
Mexican Americans (2003 - 2004)	47.0 (43.1-51.1)	54.4 (48.2-59.9)	82.9 (73.2-91.0)	121 (106-143)	152 (141-169)	618
Mexican Americans (2005 - 2006)	55.1 (51.7-58.7)	58.4 (54.1-63.6)	98.3 (91.5-105)	140 (134-150)	177 (153-200)	652
Mexican Americans (2007 - 2008)	53.3 (47.6-59.6)	57.3 (49.6-64.3)	90.4 (82.5-97.2)	140 (125-156)	176 (154-191)	515
Mexican Americans (2009 - 2010)	49.4 (45.9-53.2)	51.1 (46.4-55.4)	81.4 (76.2-85.9)	134 (115-149)	180 (148-231)	613
Non-Hispanic blacks (1999 - 2000)	57.7 (51.0-65.2)	62.2 (55.0-71.5)	97.8 (85.0-110)	153 (126-188)	206 (150-274)	546
Non-Hispanic blacks (2001 - 2002)	53.2 (49.9-56.7)	60.3 (55.1-63.8)	90.0 (81.0-101)	132 (121-147)	166 (147-170)	667
Non-Hispanic blacks (2003 - 2004)	46.0 (41.7-50.8)	46.2 (40.9-55.2)	82.3 (73.3-91.3)	117 (109-129)	156 (135-175)	723
Non-Hispanic blacks (2005 - 2006)	48.1 (44.7-51.8)	52.0 (48.3-55.7)	80.0 (71.6-89.4)	125 (112-133)	160 (139-189)	692
Non-Hispanic blacks (2007 - 2008)	51.9 (45.6-59.1)	56.9 (47.5-65.8)	90.3 (83.0-102)	137 (118-158)	168 (147-180)	589
Non-Hispanic blacks (2009 - 2010)	45.8 (41.4-50.8)	52.1 (47.9-55.6)	85.6 (77.7-94.0)	132 (107-166)	184 (152-216)	544
Non-Hispanic whites (1999 - 2000)	44.5 (37.0-53.4)	48.5 (41.1-59.8)	85.0 (76.7-96.5)	135 (119-154)	187 (146-223)	760
Non-Hispanic whites (2001 - 2002)	42.2 (38.5-46.2)	48.9 (44.2-53.2)	80.7 (71.9-85.8)	117 (108-129)	152 (134-180)	1132
Non-Hispanic whites (2003 - 2004)	37.1 (34.7-39.6)	41.3 (38.1-44.5)	75.2 (69.2-79.6)	107 (99.3-115)	130 (119-142)	1074
Non-Hispanic whites (2005 - 2006)	42.8 (39.7-46.1)	48.6 (42.3-53.4)	79.0 (73.5-84.0)	123 (108-132)	156 (136-178)	1041
Non-Hispanic whites (2007 - 2008)	41.7 (39.2-44.5)	46.5 (42.9-49.8)	81.2 (76.6-86.6)	131 (119-142)	153 (149-164)	1095
Non-Hispanic whites (2009 - 2010)	40.6 (38.1-43.1)	42.6 (39.6-45.3)	75.9 (70.6-81.0)	114 (104-123)	148 (134-166)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.8, 0.8, 1.5, 0.92, 0.92, and 0.92 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Molybdenum_BiomonitoringSummary.html

Urinary Molybdenum (2011 – 2016)

CAS Number 7439-98-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	37.1 (35.1-39.1)	40.0 (37.6-42.2)	69.1 (64.9-74.8)	111 (102-123)	146 (140-160)	2504
Total population (2013 - 2014)	33.9 (31.6-36.4)	36.0 (32.1-40.3)	68.0 (63.2-72.9)	105 (98.7-112)	139 (128-156)	2664
Total population (2015 - 2016)	35.4 (33.4-37.6)	38.6 (36.5-41.8)	68.6 (64.7-73.5)	107 (103-112)	137 (127-149)	3060
Age 3-5 years (2015 - 2016)	47.3 (43.9-50.8)	51.6 (45.8-61.1)	87.2 (81.7-94.8)	137 (114-155)	191 (146-218)	486
Age 6-11 years (2011 - 2012)	58.4 (51.5-66.2)	65.1 (52.8-74.5)	116 (95.6-129)	168 (145-199)	211 (187-283)	399
Age 6-11 years (2013 - 2014)	51.7 (47.1-56.6)	54.7 (49.3-61.9)	98.2 (82.2-105)	144 (130-164)	182 (159-210)	402
Age 6-11 years (2015 - 2016)	56.2 (51.3-61.5)	57.5 (50.2-69.1)	109 (93.2-117)	157 (132-167)	173 (165-224)	379
Age 12-19 years (2011 - 2012)	46.4 (40.2-53.7)	51.0 (44.2-61.8)	83.6 (70.1-97.7)	141 (106-153)	163 (145-173)	390
Age 12-19 years (2013 - 2014)	48.2 (41.5-55.8)	55.9 (49.0-64.8)	89.3 (80.1-97.2)	128 (105-150)	156 (136-180)	451
Age 12-19 years (2015 - 2016)	47.7 (43.3-52.6)	53.0 (45.9-57.0)	86.1 (74.2-97.7)	127 (109-143)	149 (135-166)	402
Age 20+ years (2011 - 2012)	34.1 (31.8-36.5)	37.3 (33.6-39.8)	63.6 (59.2-69.2)	101 (92.9-109)	136 (120-146)	1715
Age 20+ years (2013 - 2014)	30.8 (28.5-33.3)	32.7 (28.3-36.0)	61.6 (55.9-67.4)	95.4 (89.3-99.4)	129 (116-137)	1811
Age 20+ years (2015 - 2016)	32.0 (29.9-34.1)	35.9 (33.1-37.8)	61.9 (57.6-66.7)	99.3 (92.9-105)	124 (112-136)	1793
Males (2011 - 2012)	42.5 (38.6-46.9)	45.9 (39.7-52.6)	77.1 (71.2-84.0)	122 (105-135)	146 (136-173)	1262
Males (2013 - 2014)	37.9 (35.2-40.9)	41.3 (38.0-45.9)	73.9 (68.4-79.2)	113 (104-127)	152 (134-173)	1318
Males (2015 - 2016)	39.7 (37.1-42.4)	43.6 (39.8-47.3)	77.6 (70.5-82.5)	115 (106-125)	144 (130-157)	1524
Females (2011 - 2012)	32.5 (30.0-35.2)	33.7 (30.5-38.7)	61.5 (57.7-66.9)	102 (92.9-117)	148 (121-170)	1242
Females (2013 - 2014)	30.4 (28.2-32.8)	31.7 (26.8-36.0)	62.6 (56.0-67.2)	96.3 (87.1-105)	129 (115-142)	1346
Females (2015 - 2016)	31.8 (28.8-35.1)	34.9 (29.9-39.1)	60.4 (55.8-66.7)	102 (90.6-109)	128 (112-156)	1536
Mexican Americans (2011 - 2012)	44.1 (39.8-49.0)	49.4 (41.6-52.9)	78.8 (72.1-87.0)	117 (102-146)	167 (136-214)	317
Mexican Americans (2013 - 2014)	40.9 (34.4-48.7)	43.7 (34.8-55.7)	79.3 (64.6-90.8)	119 (96.6-149)	161 (133-205)	453
Mexican Americans (2015 - 2016)	43.4 (40.0-47.1)	47.5 (42.5-55.4)	78.2 (70.4-94.4)	123 (103-136)	149 (123-188)	585
Non-Hispanic blacks (2011 - 2012)	44.4 (41.3-47.7)	48.6 (44.6-51.8)	78.5 (70.8-89.4)	125 (110-139)	158 (138-177)	669
Non-Hispanic blacks (2013 - 2014)	43.8 (39.0-49.2)	49.3 (40.6-55.9)	79.6 (70.0-89.3)	116 (105-132)	150 (124-182)	581
Non-Hispanic blacks (2015 - 2016)	43.8 (39.6-48.3)	48.4 (42.7-54.5)	77.2 (67.0-92.9)	123 (110-146)	162 (131-217)	671
Non-Hispanic whites (2011 - 2012)	33.8 (31.4-36.4)	36.9 (32.0-40.2)	64.4 (59.4-69.4)	103 (94.2-117)	141 (125-146)	820
Non-Hispanic whites (2013 - 2014)	30.5 (27.5-33.8)	32.1 (26.5-37.4)	63.0 (54.7-68.4)	96.7 (88.9-105)	129 (113-143)	985
Non-Hispanic whites (2015 - 2016)	32.3 (29.8-35.0)	35.8 (32.2-38.1)	61.1 (56.4-67.5)	100 (93.2-107)	125 (114-137)	924
All Hispanics (2011 - 2012)	43.3 (38.9-48.2)	47.6 (40.2-53.7)	81.4 (70.5-90.3)	123 (113-141)	167 (145-184)	573
All Hispanics (2013 - 2014)	39.8 (34.7-45.7)	42.5 (34.3-52.5)	78.2 (68.4-86.4)	115 (98.0-134)	150 (134-183)	701
All Hispanics (2015 - 2016)	41.5 (38.9-44.2)	44.8 (40.7-49.6)	76.9 (72.2-84.2)	116 (107-128)	149 (133-165)	982
Asians (2011 - 2012)	44.2 (38.8-50.4)	49.7 (44.0-55.2)	83.0 (72.0-95.9)	124 (106-157)	166 (126-227)	353
Asians (2013 - 2014)	36.0 (31.3-41.4)	34.9 (31.2-40.5)	70.0 (56.1-77.6)	127 (99.4-166)	196 (133-259)	292
Asians (2015 - 2016)	37.4 (33.6-41.7)	41.3 (35.1-46.6)	76.7 (67.9-87.0)	121 (98.5-136)	145 (129-169)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.99, 0.8, and 0.8, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Molybdenum_BiomonitoringSummary.html

Urinary Molybdenum (creatinine corrected) (1999 – 2010)

CAS Number 7439-98-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	43.2 (40.0-46.6)	41.6 (38.5-45.2)	63.5 (59.3-68.8)	108 (97.3-115)	144 (125-171)	2257
Total population (2001 - 2002)	42.5 (39.9-45.2)	42.2 (40.1-45.2)	62.0 (58.4-66.4)	98.8 (90.1-109)	130 (120-149)	2689
Total population (2003 - 2004)	39.4 (37.6-41.3)	39.2 (37.9-40.7)	58.3 (55.6-61.5)	89.0 (80.5-99.0)	120 (107-135)	2558
Total population (2005 - 2006)	44.3 (42.4-46.3)	43.9 (41.8-45.7)	65.9 (61.8-68.6)	97.3 (92.5-103)	132 (125-143)	2576
Total population (2007 - 2008)	47.1 (45.8-48.4)	46.3 (44.8-47.7)	72.4 (68.7-74.3)	104 (96.7-111)	137 (127-152)	2627
Total population (2009 - 2010)	45.5 (43.2-47.8)	44.4 (41.9-47.4)	67.2 (64.7-69.4)	105 (95.4-121)	143 (129-157)	2848
Age 6-11 years (1999 - 2000)	85.9 (73.7-100)	79.3 (71.6-88.4)	122 (107-133)	173 (130-243)	214 (154-1040)	310
Age 6-11 years (2001 - 2002)	77.2 (73.1-81.5)	77.6 (71.8-84.5)	109 (99.4-120)	159 (129-170)	185 (165-219)	368
Age 6-11 years (2003 - 2004)	72.5 (65.2-80.7)	73.5 (65.1-79.9)	101 (84.9-117)	132 (107-158)	160 (129-257)	290
Age 6-11 years (2005 - 2006)	81.0 (71.9-91.3)	78.6 (72.1-89.0)	112 (93.7-134)	161 (133-199)	201 (160-261)	355
Age 6-11 years (2007 - 2008)	90.4 (81.8-99.8)	88.2 (79.2-101)	133 (113-147)	206 (159-259)	274 (224-354)	394
Age 6-11 years (2009 - 2010)	88.6 (81.9-95.9)	89.0 (79.2-95.4)	131 (123-148)	174 (154-191)	195 (178-216)	378
Age 12-19 years (1999 - 2000)	41.9 (39.3-44.6)	40.5 (37.7-44.4)	57.3 (51.5-62.5)	85.4 (67.4-107)	112 (78.4-185)	648
Age 12-19 years (2001 - 2002)	43.4 (40.8-46.1)	44.1 (40.8-47.2)	60.8 (57.6-63.7)	85.5 (79.7-93.8)	106 (94.8-118)	762
Age 12-19 years (2003 - 2004)	37.5 (35.4-39.8)	38.9 (36.9-41.8)	53.2 (50.3-56.1)	71.9 (64.6-76.9)	81.0 (74.3-102)	725
Age 12-19 years (2005 - 2006)	45.5 (42.5-48.7)	45.7 (41.3-49.2)	64.6 (58.5-71.2)	91.4 (75.3-102)	109 (95.0-131)	701
Age 12-19 years (2007 - 2008)	50.1 (47.2-53.2)	50.1 (44.2-53.4)	71.6 (64.0-79.6)	95.8 (85.1-107)	129 (99.5-138)	376
Age 12-19 years (2009 - 2010)	49.0 (45.3-53.0)	50.7 (44.6-56.2)	67.6 (63.0-73.1)	93.6 (85.8-101)	126 (96.4-134)	451
Age 20+ years (1999 - 2000)	39.6 (36.9-42.6)	38.5 (36.1-41.0)	56.4 (53.5-60.7)	92.5 (83.1-100)	122 (116-147)	1299
Age 20+ years (2001 - 2002)	39.3 (36.8-42.0)	39.6 (36.4-42.1)	57.2 (52.9-61.0)	86.7 (75.2-96.8)	123 (109-139)	1559
Age 20+ years (2003 - 2004)	36.9 (35.0-38.9)	37.0 (35.7-38.4)	53.5 (50.0-56.9)	79.8 (75.9-87.5)	118 (101-134)	1543
Age 20+ years (2005 - 2006)	41.2 (39.3-43.1)	40.5 (38.8-42.7)	59.1 (55.6-62.8)	87.9 (79.7-96.9)	119 (103-132)	1520
Age 20+ years (2007 - 2008)	43.5 (42.1-44.9)	42.9 (41.3-44.7)	64.9 (61.7-69.9)	94.7 (90.8-97.1)	122 (110-132)	1857
Age 20+ years (2009 - 2010)	41.9 (40.0-43.9)	41.2 (39.4-43.0)	61.9 (59.0-64.0)	90.4 (84.3-98.5)	127 (115-141)	2019
Males (1999 - 2000)	40.8 (37.5-44.3)	38.5 (37.2-40.4)	62.4 (55.9-68.4)	101 (83.9-118)	131 (112-179)	1121
Males (2001 - 2002)	40.3 (37.1-43.8)	40.2 (36.3-43.3)	60.5 (54.8-66.3)	91.3 (83.4-106)	123 (107-155)	1334
Males (2003 - 2004)	38.3 (36.1-40.7)	37.8 (36.1-39.3)	56.3 (53.3-59.3)	85.7 (77.2-96.7)	118 (100-139)	1281
Males (2005 - 2006)	41.8 (39.5-44.2)	41.7 (39.2-44.1)	62.1 (58.1-67.4)	94.6 (84.2-101)	126 (112-132)	1271
Males (2007 - 2008)	45.3 (43.8-46.8)	44.6 (42.9-46.7)	72.3 (65.4-74.8)	105 (96.0-118)	135 (126-152)	1327
Males (2009 - 2010)	42.1 (39.6-44.9)	41.3 (38.7-44.2)	63.4 (59.4-67.4)	101 (88.3-121)	139 (123-151)	1398
Females (1999 - 2000)	45.5 (41.5-50.0)	44.1 (39.5-48.8)	64.4 (59.5-70.5)	112 (95.2-121)	152 (122-181)	1136
Females (2001 - 2002)	44.6 (42.2-47.1)	45.1 (42.2-46.9)	63.6 (59.5-69.4)	107 (92.5-119)	136 (117-169)	1355
Females (2003 - 2004)	40.5 (38.1-43.0)	41.1 (38.7-43.7)	61.4 (56.8-65.1)	90.1 (82.2-103)	122 (115-142)	1277
Females (2005 - 2006)	46.9 (44.7-49.2)	46.5 (43.9-48.8)	67.2 (63.3-71.7)	103 (93.6-110)	157 (126-173)	1305
Females (2007 - 2008)	48.9 (47.2-50.7)	48.3 (45.7-51.0)	72.6 (69.2-74.4)	103 (93.6-116)	139 (113-177)	1300
Females (2009 - 2010)	48.9 (46.4-51.5)	48.8 (45.8-51.5)	70.1 (67.2-73.9)	109 (97.1-125)	148 (137-162)	1450

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Molybdenum_BiomonitoringSummary.html

Urinary Molybdenum (creatinine corrected) (1999 – 2010)

CAS Number 7439-98-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	42.9 (40.6-45.4)	43.2 (40.9-45.6)	61.6 (57.2-65.5)	89.5 (80.0-103)	115 (93.7-137)	780
Mexican Americans (2001 - 2002)	48.1 (44.3-52.2)	48.4 (44.8-52.3)	71.7 (66.4-76.0)	103 (90.0-120)	129 (109-155)	682
Mexican Americans (2003 - 2004)	43.5 (40.5-46.8)	43.5 (41.0-46.2)	62.8 (56.8-67.2)	85.9 (79.5-97.0)	112 (97.0-133)	618
Mexican Americans (2005 - 2006)	51.8 (49.9-53.8)	52.1 (49.7-54.7)	73.5 (69.5-77.4)	106 (99.5-111)	133 (112-151)	652
Mexican Americans (2007 - 2008)	53.3 (50.2-56.5)	51.9 (47.1-55.3)	77.9 (70.6-82.1)	113 (103-129)	151 (132-185)	515
Mexican Americans (2009 - 2010)	51.8 (48.9-54.9)	51.4 (48.3-54.8)	74.0 (68.7-78.8)	109 (92.7-125)	148 (125-173)	613
Non-Hispanic blacks (1999 - 2000)	37.2 (33.4-41.6)	37.1 (33.0-41.2)	55.9 (49.6-63.3)	88.2 (69.1-112)	119 (88.3-141)	546
Non-Hispanic blacks (2001 - 2002)	36.5 (34.1-39.0)	37.5 (35.1-38.9)	57.1 (49.7-62.4)	78.3 (71.5-92.0)	109 (81.1-127)	667
Non-Hispanic blacks (2003 - 2004)	33.1 (30.5-35.9)	31.7 (30.1-34.7)	47.2 (43.7-52.1)	72.9 (64.6-78.4)	90.5 (78.4-118)	723
Non-Hispanic blacks (2005 - 2006)	34.9 (33.1-36.8)	35.4 (32.7-38.1)	53.5 (49.7-55.8)	81.1 (75.4-89.4)	102 (89.4-119)	692
Non-Hispanic blacks (2007 - 2008)	38.0 (34.8-41.4)	38.7 (34.2-43.0)	57.0 (52.7-60.2)	82.0 (73.2-92.4)	105 (92.0-118)	589
Non-Hispanic blacks (2009 - 2010)	36.3 (32.9-40.1)	37.2 (35.1-39.5)	54.7 (50.3-60.4)	85.2 (68.6-110)	121 (97.1-155)	544
Non-Hispanic whites (1999 - 2000)	44.5 (40.2-49.2)	42.1 (38.8-47.3)	65.3 (58.9-71.3)	116 (101-126)	172 (131-195)	760
Non-Hispanic whites (2001 - 2002)	42.5 (39.3-46.0)	41.9 (39.3-45.6)	61.2 (57.1-67.2)	104 (88.7-120)	138 (120-163)	1132
Non-Hispanic whites (2003 - 2004)	39.1 (37.2-41.1)	39.3 (37.7-40.8)	58.1 (54.6-61.4)	87.4 (78.9-96.7)	118 (106-134)	1074
Non-Hispanic whites (2005 - 2006)	44.5 (42.4-46.6)	43.9 (41.7-45.7)	65.0 (59.9-68.5)	97.3 (90.7-105)	132 (119-152)	1041
Non-Hispanic whites (2007 - 2008)	46.7 (45.0-48.6)	46.1 (43.6-48.4)	72.4 (65.8-75.1)	103 (95.7-113)	135 (120-152)	1095
Non-Hispanic whites (2009 - 2010)	45.3 (42.4-48.5)	44.2 (41.5-48.4)	66.6 (63.1-69.3)	101 (88.4-124)	141 (121-159)	1225

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Molybdenum_BiomonitoringSummary.html

Urinary Molybdenum (creatinine corrected) (2011 – 2016)

CAS Number 7439-98-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	42.0 (40.4-43.6)	41.0 (38.6-44.4)	62.9 (61.2-65.5)	95.1 (90.9-101)	130 (118-148)	2502
Total population (2013 - 2014)	39.1 (37.3-41.1)	39.4 (37.5-41.0)	59.3 (57.1-62.2)	86.9 (83.7-92.5)	117 (108-125)	2663
Total population (2015 - 2016)	39.8 (38.1-41.5)	40.0 (37.6-42.3)	60.0 (57.4-63.3)	92.2 (86.1-98.4)	123 (114-126)	3057
Age 3-5 years (2015 - 2016)	109 (102-116)	107 (98.4-117)	148 (137-176)	227 (212-250)	275 (239-329)	485
Age 6-11 years (2011 - 2012)	83.5 (76.1-91.6)	81.7 (74.3-91.2)	120 (110-129)	178 (146-240)	259 (185-300)	398
Age 6-11 years (2013 - 2014)	77.0 (73.5-80.8)	73.5 (70.0-81.4)	106 (98.4-117)	153 (129-172)	184 (164-225)	402
Age 6-11 years (2015 - 2016)	79.7 (75.5-84.1)	79.6 (69.9-86.7)	112 (101-124)	156 (132-190)	200 (171-229)	379
Age 12-19 years (2011 - 2012)	44.4 (40.8-48.4)	43.7 (39.1-48.0)	62.0 (57.8-65.9)	90.4 (76.5-94.8)	109 (92.4-131)	390
Age 12-19 years (2013 - 2014)	43.6 (40.3-47.2)	44.0 (39.1-47.3)	63.2 (59.9-70.8)	90.2 (74.7-107)	113 (95.9-140)	451
Age 12-19 years (2015 - 2016)	44.6 (41.9-47.5)	45.0 (41.8-48.7)	61.6 (58.1-65.7)	86.6 (74.6-103)	107 (89.3-133)	402
Age 20+ years (2011 - 2012)	38.6 (37.1-40.2)	38.5 (36.1-41.0)	57.9 (53.9-61.2)	85.0 (79.5-89.3)	112 (102-123)	1714
Age 20+ years (2013 - 2014)	35.9 (33.7-38.2)	36.9 (35.1-38.4)	53.4 (50.4-57.1)	79.7 (73.4-83.7)	97.8 (88.5-111)	1810
Age 20+ years (2015 - 2016)	34.9 (33.3-36.6)	36.3 (34.4-38.1)	52.1 (49.3-55.5)	76.0 (70.3-79.7)	94.7 (85.8-102)	1791
Males (2011 - 2012)	39.8 (37.5-42.2)	40.0 (36.0-43.6)	59.5 (56.1-62.9)	88.2 (84.7-96.7)	118 (108-131)	1261
Males (2013 - 2014)	37.9 (35.4-40.6)	38.0 (35.7-40.3)	58.7 (54.5-62.5)	87.7 (82.3-96.4)	119 (104-128)	1317
Males (2015 - 2016)	37.7 (35.2-40.3)	37.2 (35.7-38.9)	57.1 (53.9-61.6)	88.5 (82.1-97.6)	116 (104-126)	1524
Females (2011 - 2012)	44.2 (41.5-47.0)	43.3 (39.2-45.5)	67.1 (62.8-69.7)	102 (92.4-111)	149 (118-157)	1241
Females (2013 - 2014)	40.4 (38.3-42.6)	40.5 (38.4-43.3)	60.6 (57.1-64.6)	86.8 (82.1-94.4)	116 (104-125)	1346
Females (2015 - 2016)	41.9 (39.4-44.5)	42.3 (38.7-46.2)	63.0 (58.4-69.1)	95.3 (86.2-106)	126 (114-133)	1533
Mexican Americans (2011 - 2012)	49.6 (43.1-57.1)	48.9 (43.0-56.0)	72.8 (63.6-85.3)	114 (85.7-149)	164 (114-224)	317
Mexican Americans (2013 - 2014)	46.7 (41.1-53.1)	45.7 (39.0-52.4)	66.9 (60.3-73.0)	103 (83.6-123)	136 (111-205)	453
Mexican Americans (2015 - 2016)	47.4 (44.2-50.9)	47.8 (43.7-52.2)	68.0 (62.6-76.3)	107 (91.0-118)	130 (118-145)	584
Non-Hispanic blacks (2011 - 2012)	34.5 (32.1-37.1)	34.0 (32.0-36.1)	52.4 (48.0-58.3)	80.7 (70.7-91.7)	104 (87.4-120)	669
Non-Hispanic blacks (2013 - 2014)	33.4 (32.1-34.7)	33.7 (31.4-36.6)	50.1 (46.7-52.9)	74.1 (64.2-81.3)	89.1 (80.9-110)	581
Non-Hispanic blacks (2015 - 2016)	34.8 (31.9-37.9)	34.5 (31.3-38.6)	53.5 (47.6-58.8)	83.3 (70.7-96.7)	113 (93.3-134)	669
Non-Hispanic whites (2011 - 2012)	40.8 (38.4-43.4)	40.0 (37.0-44.6)	61.3 (57.2-64.6)	91.6 (84.9-101)	118 (109-148)	818
Non-Hispanic whites (2013 - 2014)	37.5 (35.0-40.2)	38.2 (36.1-40.7)	58.2 (53.4-62.8)	84.9 (79.7-91.9)	108 (97.2-119)	984
Non-Hispanic whites (2015 - 2016)	38.0 (35.8-40.5)	38.1 (36.1-41.3)	57.4 (53.8-61.7)	85.8 (80.8-91.7)	111 (99.0-124)	924
All Hispanics (2011 - 2012)	48.5 (44.5-52.8)	48.7 (44.4-51.9)	71.5 (65.5-76.8)	105 (90.4-122)	146 (112-181)	573
All Hispanics (2013 - 2014)	44.4 (40.7-48.6)	44.1 (38.8-48.1)	64.6 (60.3-69.7)	98.0 (85.4-108)	128 (112-160)	701
All Hispanics (2015 - 2016)	46.9 (44.7-49.3)	47.8 (44.5-50.3)	67.7 (63.9-73.2)	105 (95.0-115)	131 (123-142)	981
Asians (2011 - 2012)	59.1 (54.2-64.5)	59.5 (51.6-65.2)	91.5 (81.6-102)	158 (137-174)	202 (163-248)	353
Asians (2013 - 2014)	56.4 (50.3-63.2)	51.8 (46.6-56.8)	85.1 (69.2-109)	165 (122-184)	197 (166-292)	292
Asians (2015 - 2016)	51.1 (46.0-56.8)	49.6 (43.6-56.4)	73.4 (67.3-85.6)	120 (105-142)	165 (132-199)	332

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Molybdenum_BiomonitoringSummary.html

Urinary Platinum (1999 – 2010)‡

CAS Number 7740-106-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	2465
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2690
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2558
Total population (2005 - 2006)	*	< LOD	< LOD	.009 (<LOD-.012)	.014 (.009-.025)	2576
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2627
Total population (2009 - 2010)	*	< LOD	< LOD	.009 (<LOD-.015)	.016 (.009-.049)	2847
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	340
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	368
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	290
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	.010 (<LOD-.011)	.014 (.010-.020)	355
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.009 (<LOD-.011)	394
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.010 (<LOD-.014)	.015 (.009-.036)	378
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	719
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	762
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	725
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	.012 (.009-.019)	701
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.009 (<LOD-.017)	376
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	.010 (<LOD-.019)	.018 (<LOD-.078)	451
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1406
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1560
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1543
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	.009 (<LOD-.014)	.014 (.009-.032)	1520
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1857
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	.009 (<LOD-.016)	.017 (.009-.049)	2018
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1227
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1335
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1281
Males (2005 - 2006)	*	< LOD	< LOD	.009 (<LOD-.012)	.012 (.009-.020)	1271
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1327
Males (2009 - 2010)	*	< LOD	< LOD	.009 (<LOD-.015)	.016 (<LOD-.047)	1397
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1238
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1355
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1277
Females (2005 - 2006)	*	< LOD	< LOD	.010 (<LOD-.014)	.015 (.010-.033)	1305
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	.009 (<LOD-.009)	1300
Females (2009 - 2010)	*	< LOD	< LOD	.010 (<LOD-.015)	.017 (.009-.051)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.04, 0.04, 0.07, 0.009, 0.009, and 0.009 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Platinum_BiomonitoringSummary.html

Urinary Platinum (1999 – 2010)‡

CAS Number 7740-106-4

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	884
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	683
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	618
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.010 (<LOD-.014)	.014 (.009-.023)	652
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	.009 (<LOD-.010)	515
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	.010 (.009-.012)	613
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	667
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	723
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	.011 (.009-.016)	692
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	.009 (<LOD-.013)	589
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.012 (<LOD-.032)	.024 (.009-.103)	544
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1132
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1074
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	.009 (<LOD-.012)	.013 (.009-.026)	1041
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	.009 (<LOD-.009)	1095
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.009 (<LOD-.019)	.018 (<LOD-.073)	1224

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.04, 0.04, 0.07, 0.009, 0.009, and 0.009 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Platinum_BiomonitoringSummary.html

Urinary Platinum (creatinine corrected) (1999 – 2010)‡

CAS Number 7740-106-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	2465
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2689
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2558
Total population (2005 - 2006)	*	< LOD	< LOD	.021 (<LOD-.023)	.029 (.026-.035)	2576
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2627
Total population (2009 - 2010)	*	< LOD	< LOD	.023 (<LOD-.027)	.033 (.026-.046)	2847
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	340
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	368
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	290
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	.020 (<LOD-.027)	.030 (.021-.050)	355
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.026 (<LOD-.032)	394
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	.026 (<LOD-.030)	.043 (.027-.050)	378
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	719
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	762
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	725
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	.017 (.012-.026)	701
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.017 (<LOD-.025)	376
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	.021 (<LOD-.029)	.032 (<LOD-.050)	451
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1406
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1559
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1543
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	.022 (<LOD-.025)	.030 (.026-.035)	1520
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1857
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	.023 (<LOD-.030)	.035 (.024-.050)	2018
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1227
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1334
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1281
Males (2005 - 2006)	*	< LOD	< LOD	.014 (<LOD-.016)	.021 (.016-.025)	1271
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1327
Males (2009 - 2010)	*	< LOD	< LOD	.019 (<LOD-.025)	.027 (<LOD-.036)	1397
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1238
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1355
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1277
Females (2005 - 2006)	*	< LOD	< LOD	.026 (<LOD-.030)	.033 (.029-.050)	1305
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	.033 (<LOD-.043)	1300
Females (2009 - 2010)	*	< LOD	< LOD	.027 (<LOD-.032)	.038 (.030-.054)	1450

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Platinum_BiomonitoringSummary.html

Urinary Platinum (creatinine corrected) (1999 – 2010)‡

CAS Number 7740-106-4

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	884
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	682
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	618
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.016 (<LOD-.019)	.023 (.017-.032)	652
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	.025 (<LOD-.033)	515
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	.025 (.021-.029)	613
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	667
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	723
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	.018 (.014-.022)	692
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	.017 (<LOD-.021)	589
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.017 (<LOD-.024)	.027 (.019-.050)	544
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1132
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1074
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	.023 (<LOD-.025)	.030 (.027-.035)	1041
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	.030 (<LOD-.038)	1095
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.025 (<LOD-.032)	.036 (<LOD-.058)	1224

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Platinum_BiomonitoringSummary.html

Blood Selenium (2011 – 2016)

CAS Number 7782-49-2

Geometric mean and selected percentiles of blood concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	190 (187-193)	190 (187-193)	206 (203-210)	223 (219-228)	236 (231-241)	7920
Total population (2013 - 2014)	193 (191-195)	193 (190-195)	208 (205-210)	223 (220-228)	235 (232-239)	5215
Total population (2015 - 2016)	191 (187-195)	191 (187-195)	206 (202-210)	223 (218-226)	233 (227-242)	4987
Age 1-5 years (2011 - 2012)	167 (164-171)	167 (163-172)	181 (175-187)	196 (187-201)	201 (197-207)	713
Age 1-5 years (2013 - 2014)	168 (166-171)	169 (166-172)	180 (177-183)	192 (187-197)	201 (196-205)	818
Age 1-5 years (2015 - 2016)	167 (163-170)	167 (164-170)	179 (175-183)	190 (186-194)	198 (191-206)	790
Age 6-11 years (2011 - 2012)	176 (172-180)	177 (172-181)	189 (185-193)	201 (197-206)	208 (205-215)	1048
Age 6-11 years (2013 - 2014)	180 (177-183)	180 (176-183)	191 (187-195)	204 (198-210)	212 (205-218)	1075
Age 6-11 years (2015 - 2016)	177 (174-180)	177 (174-181)	190 (186-194)	201 (196-205)	209 (201-213)	1023
Age 12-19 years (2011 - 2012)	189 (184-193)	189 (182-194)	206 (198-211)	220 (212-231)	232 (221-245)	1129
Age 12-19 years (2013 - 2014)	191 (188-194)	192 (188-194)	204 (200-208)	218 (212-222)	224 (220-231)	627
Age 12-19 years (2015 - 2016)	192 (188-196)	192 (188-195)	207 (202-210)	221 (215-227)	228 (221-235)	565
Age 20+ years (2011 - 2012)	193 (190-196)	193 (190-196)	209 (205-213)	227 (222-231)	238 (233-243)	5030
Age 20+ years (2013 - 2014)	196 (194-198)	196 (193-198)	210 (207-213)	227 (222-232)	238 (235-242)	2695
Age 20+ years (2015 - 2016)	194 (190-198)	193 (189-198)	208 (203-212)	224 (219-230)	237 (230-243)	2609
Males (2011 - 2012)	192 (189-195)	192 (188-195)	208 (204-213)	227 (221-232)	238 (232-243)	3968
Males (2013 - 2014)	195 (192-197)	195 (193-197)	209 (206-213)	225 (220-231)	235 (230-242)	2587
Males (2015 - 2016)	193 (189-196)	193 (190-196)	207 (203-211)	224 (218-229)	235 (227-244)	2488
Females (2011 - 2012)	188 (185-191)	188 (186-191)	204 (201-207)	220 (218-224)	233 (227-240)	3952
Females (2013 - 2014)	191 (189-193)	190 (187-193)	205 (202-208)	222 (218-225)	235 (231-238)	2628
Females (2015 - 2016)	189 (185-193)	189 (184-194)	205 (201-209)	221 (214-226)	232 (225-240)	2499
Mexican Americans (2011 - 2012)	189 (184-194)	189 (183-195)	205 (200-209)	220 (217-223)	229 (224-233)	1077
Mexican Americans (2013 - 2014)	191 (188-195)	192 (186-197)	206 (201-210)	221 (214-228)	232 (223-234)	969
Mexican Americans (2015 - 2016)	189 (183-195)	189 (183-197)	204 (198-213)	219 (213-225)	228 (220-237)	994
Non-Hispanic blacks (2011 - 2012)	184 (181-187)	183 (180-187)	199 (196-202)	216 (211-220)	226 (220-233)	2195
Non-Hispanic blacks (2013 - 2014)	190 (187-193)	190 (187-193)	204 (201-209)	222 (219-225)	232 (225-238)	1119
Non-Hispanic blacks (2015 - 2016)	187 (183-190)	185 (181-190)	201 (196-205)	217 (212-221)	228 (221-235)	1070
Non-Hispanic whites (2011 - 2012)	192 (188-196)	192 (188-196)	208 (204-213)	227 (220-232)	238 (231-245)	2493
Non-Hispanic whites (2013 - 2014)	194 (191-196)	194 (191-196)	208 (204-211)	224 (219-230)	236 (232-240)	1848
Non-Hispanic whites (2015 - 2016)	193 (189-197)	193 (189-198)	207 (203-211)	224 (218-228)	234 (227-242)	1510
All Hispanics (2011 - 2012)	187 (183-191)	188 (183-192)	203 (198-208)	218 (214-222)	228 (223-234)	1931
All Hispanics (2013 - 2014)	191 (189-194)	192 (187-196)	206 (203-209)	222 (217-225)	231 (227-234)	1481
All Hispanics (2015 - 2016)	187 (182-191)	187 (183-192)	202 (197-209)	217 (211-222)	227 (220-234)	1664
Asians (2011 - 2012)	193 (189-197)	192 (188-196)	210 (204-215)	227 (223-235)	243 (233-253)	1005
Asians (2013 - 2014)	196 (192-201)	194 (189-200)	212 (206-221)	234 (224-245)	251 (237-264)	510
Asians (2015 - 2016)	194 (188-200)	194 (188-199)	210 (201-217)	229 (219-242)	246 (234-269)	479

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 30.0, 24.5, and 24.5 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Serum Selenium (2011 – 2014)

CAS Number 7782-49-2

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	127 (125-130)	127 (124-130)	139 (136-142)	151 (148-155)	161 (156-164)	2329
Total population (2013 - 2014)	128 (126-130)	127 (126-130)	139 (137-142)	151 (149-153)	159 (156-161)	2519
Age 6-11 years (2011 - 2012)	117 (115-119)	118 (115-120)	128 (124-130)	133 (132-136)	138 (135-140)	316
Age 6-11 years (2013 - 2014)	118 (115-120)	117 (114-121)	127 (123-131)	135 (130-142)	142 (136-144)	339
Age 12-19 years (2011 - 2012)	125 (122-128)	124 (121-127)	136 (130-139)	145 (139-153)	154 (143-178)	366
Age 12-19 years (2013 - 2014)	124 (121-127)	123 (120-126)	134 (128-141)	146 (139-151)	151 (144-157)	418
Age 20+ years (2011 - 2012)	129 (126-132)	129 (125-132)	141 (138-144)	153 (149-157)	163 (158-166)	1647
Age 20+ years (2013 - 2014)	129 (127-131)	129 (127-131)	141 (138-144)	153 (151-154)	161 (157-162)	1762
Males (2011 - 2012)	129 (127-132)	129 (126-132)	142 (138-145)	153 (147-162)	163 (155-167)	1162
Males (2013 - 2014)	130 (128-132)	130 (127-132)	144 (141-146)	153 (151-156)	161 (157-162)	1235
Females (2011 - 2012)	125 (123-128)	125 (122-129)	137 (134-141)	149 (145-154)	158 (151-166)	1167
Females (2013 - 2014)	125 (124-127)	126 (123-128)	136 (134-139)	147 (145-149)	154 (152-159)	1284
Mexican Americans (2011 - 2012)	126 (124-128)	124 (122-127)	137 (134-140)	151 (142-157)	157 (153-163)	285
Mexican Americans (2013 - 2014)	129 (125-134)	128 (124-135)	140 (136-146)	153 (147-159)	159 (152-165)	431
Non-Hispanic blacks (2011 - 2012)	122 (120-124)	122 (119-124)	132 (130-134)	143 (139-145)	149 (145-157)	620
Non-Hispanic blacks (2013 - 2014)	124 (122-127)	124 (122-127)	135 (131-138)	147 (140-152)	153 (150-160)	516
Non-Hispanic whites (2011 - 2012)	129 (126-133)	129 (125-133)	142 (138-145)	154 (149-158)	163 (158-167)	780
Non-Hispanic whites (2013 - 2014)	128 (125-130)	128 (125-130)	140 (136-143)	151 (148-153)	158 (154-161)	975
All Hispanics (2011 - 2012)	125 (123-126)	123 (122-125)	135 (131-140)	149 (144-153)	157 (151-163)	525
All Hispanics (2013 - 2014)	129 (126-132)	129 (125-134)	141 (138-145)	153 (148-156)	159 (155-163)	666
Asians (2011 - 2012)	126 (123-129)	124 (120-128)	137 (135-140)	152 (143-158)	158 (152-171)	323
Asians (2013 - 2014)	130 (126-134)	129 (124-133)	142 (137-147)	159 (151-170)	172 (159-182)	267

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 4.5 and 4.5, respectively.

Urinary Strontium (2011 – 2016)

CAS Number 7440-24-6

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	85.8 (80.8-91.1)	90.5 (82.6-98.2)	167 (156-176)	249 (229-269)	321 (288-352)	2503
Total population (2013 - 2014)	81.2 (77.6-85.1)	88.1 (83.3-92.7)	151 (142-157)	231 (216-244)	299 (267-342)	2664
Total population (2015 - 2016)	85.5 (79.8-91.6)	96.3 (89.3-104)	161 (151-172)	235 (222-259)	299 (282-328)	3061
Age 3-5 years (2015 - 2016)	53.7 (49.0-58.9)	61.4 (53.8-71.6)	122 (112-132)	190 (151-209)	218 (200-264)	486
Age 6-11 years (2011 - 2012)	81.9 (69.7-96.2)	91.7 (72.8-106)	179 (135-226)	285 (236-319)	349 (265-466)	399
Age 6-11 years (2013 - 2014)	66.6 (58.6-75.6)	77.8 (67.4-89.2)	133 (119-150)	195 (156-230)	232 (198-255)	402
Age 6-11 years (2015 - 2016)	74.5 (66.4-83.5)	87.3 (66.1-104)	144 (128-168)	207 (185-233)	253 (207-333)	379
Age 12-19 years (2011 - 2012)	96.8 (82.3-114)	101 (86.4-128)	185 (160-215)	296 (226-348)	350 (274-426)	390
Age 12-19 years (2013 - 2014)	98.1 (85.0-113)	117 (96.6-138)	184 (173-199)	285 (245-311)	369 (294-383)	451
Age 12-19 years (2015 - 2016)	89.2 (77.3-103)	99.5 (81.4-118)	192 (146-223)	277 (241-333)	349 (304-378)	402
Age 20+ years (2011 - 2012)	84.6 (79.5-90.1)	87.8 (79.9-95.5)	160 (154-171)	239 (222-262)	307 (271-346)	1714
Age 20+ years (2013 - 2014)	80.7 (76.3-85.3)	86.0 (81.3-90.6)	145 (134-154)	226 (209-244)	298 (260-348)	1811
Age 20+ years (2015 - 2016)	87.9 (81.6-94.8)	97.5 (90.4-108)	162 (151-174)	234 (220-259)	299 (280-339)	1794
Males (2011 - 2012)	95.8 (88.7-103)	102 (95.6-114)	172 (157-189)	255 (215-291)	307 (277-358)	1262
Males (2013 - 2014)	87.8 (82.5-93.4)	94.8 (88.0-102)	158 (147-176)	235 (219-256)	312 (273-344)	1318
Males (2015 - 2016)	94.7 (88.7-101)	107 (95.3-121)	172 (162-177)	250 (228-278)	311 (285-347)	1524
Females (2011 - 2012)	77.2 (71.5-83.4)	78.3 (72.4-85.2)	156 (140-173)	243 (221-270)	331 (276-355)	1241
Females (2013 - 2014)	75.4 (71.0-80.1)	79.2 (75.8-84.5)	141 (130-151)	221 (190-251)	286 (253-368)	1346
Females (2015 - 2016)	77.6 (70.5-85.4)	86.5 (76.5-96.2)	149 (142-161)	226 (214-245)	283 (249-344)	1537
Mexican Americans (2011 - 2012)	85.8 (76.0-96.8)	89.4 (76.1-103)	189 (165-200)	258 (228-266)	302 (260-345)	317
Mexican Americans (2013 - 2014)	93.0 (80.8-107)	97.0 (83.7-111)	165 (144-201)	248 (209-328)	339 (254-443)	453
Mexican Americans (2015 - 2016)	83.5 (73.3-95.1)	92.6 (78.4-109)	167 (145-184)	260 (218-312)	329 (270-431)	585
Non-Hispanic blacks (2011 - 2012)	74.9 (68.0-82.4)	82.8 (75.8-91.3)	143 (132-160)	221 (194-239)	269 (239-298)	669
Non-Hispanic blacks (2013 - 2014)	73.8 (68.7-79.2)	82.0 (77.1-92.4)	132 (123-147)	213 (178-235)	255 (232-292)	581
Non-Hispanic blacks (2015 - 2016)	76.2 (67.7-85.8)	87.3 (80.4-92.5)	147 (135-168)	225 (201-261)	294 (261-339)	671
Non-Hispanic whites (2011 - 2012)	87.2 (80.4-94.6)	91.1 (81.0-100)	169 (154-180)	256 (214-296)	343 (278-391)	819
Non-Hispanic whites (2013 - 2014)	79.8 (75.0-84.8)	85.6 (79.9-92.3)	149 (137-157)	223 (206-251)	298 (254-363)	985
Non-Hispanic whites (2015 - 2016)	88.1 (79.3-97.8)	97.8 (87.9-111)	160 (146-176)	232 (210-262)	287 (262-354)	924
All Hispanics (2011 - 2012)	85.6 (74.8-98.0)	89.4 (77.8-108)	170 (151-198)	246 (221-262)	289 (260-325)	573
All Hispanics (2013 - 2014)	90.3 (80.5-101)	97.0 (87.0-106)	164 (149-189)	246 (223-278)	326 (255-390)	701
All Hispanics (2015 - 2016)	81.9 (73.2-91.7)	94.3 (78.2-110)	164 (147-180)	250 (217-286)	312 (274-356)	982
Asians (2011 - 2012)	97.0 (85.7-110)	98.4 (84.8-121)	187 (161-206)	280 (239-303)	343 (288-384)	353
Asians (2013 - 2014)	85.5 (72.5-101)	93.0 (80.1-105)	159 (132-189)	290 (189-383)	372 (241-534)	292
Asians (2015 - 2016)	87.6 (80.7-95.2)	94.5 (86.1-104)	165 (144-180)	268 (191-301)	302 (270-398)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 2.5, 2.34, and 2.34, respectively.

Urinary Strontium (creatinine corrected) (2011 – 2016)

CAS Number 7440-24-6

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	97.2 (90.1-105)	99.7 (91.4-110)	156 (143-174)	240 (221-258)	320 (287-341)	2501
Total population (2013 - 2014)	93.9 (88.6-99.5)	100 (93.2-105)	150 (142-158)	225 (194-254)	287 (255-324)	2663
Total population (2015 - 2016)	96.0 (91.8-100)	102 (97.0-107)	153 (147-159)	214 (204-232)	278 (256-295)	3058
Age 3-5 years (2015 - 2016)	124 (111-137)	135 (120-160)	232 (199-264)	344 (302-368)	424 (346-487)	485
Age 6-11 years (2011 - 2012)	118 (104-133)	124 (105-150)	222 (185-245)	288 (271-338)	354 (299-507)	398
Age 6-11 years (2013 - 2014)	99.3 (84.0-117)	113 (87.2-136)	181 (151-224)	254 (224-303)	303 (255-316)	402
Age 6-11 years (2015 - 2016)	106 (95.5-117)	117 (104-129)	170 (149-217)	256 (194-319)	296 (247-359)	379
Age 12-19 years (2011 - 2012)	92.6 (79.6-108)	95.3 (73.9-119)	150 (122-172)	221 (175-248)	279 (228-320)	390
Age 12-19 years (2013 - 2014)	88.8 (83.7-94.2)	94.9 (88.0-104)	141 (129-151)	203 (181-227)	232 (207-270)	451
Age 12-19 years (2015 - 2016)	83.4 (75.3-92.3)	89.5 (83.2-103)	133 (117-146)	177 (162-203)	239 (193-263)	402
Age 20+ years (2011 - 2012)	95.9 (89.0-103)	98.6 (91.0-109)	155 (140-171)	233 (213-255)	315 (278-346)	1713
Age 20+ years (2013 - 2014)	94.1 (88.5-100)	100 (92.4-105)	148 (140-157)	223 (193-256)	294 (255-339)	1810
Age 20+ years (2015 - 2016)	96.0 (91.9-100)	101 (95.7-105)	152 (146-159)	210 (197-221)	266 (243-295)	1792
Males (2011 - 2012)	89.5 (82.2-97.5)	91.8 (86.2-101)	142 (130-159)	210 (190-237)	275 (239-314)	1261
Males (2013 - 2014)	87.9 (83.7-92.2)	93.4 (87.8-100)	139 (130-150)	199 (181-228)	253 (207-294)	1317
Males (2015 - 2016)	89.9 (86.0-94.0)	93.6 (89.2-98.7)	146 (138-153)	201 (193-210)	256 (235-285)	1524
Females (2011 - 2012)	105 (96.6-114)	110 (98.5-117)	178 (152-203)	261 (237-313)	346 (315-371)	1240
Females (2013 - 2014)	100 (92.5-108)	105 (95.4-113)	159 (150-171)	244 (216-288)	325 (278-390)	1346
Females (2015 - 2016)	102 (95.5-109)	109 (105-117)	160 (149-170)	232 (213-249)	291 (266-338)	1534
Mexican Americans (2011 - 2012)	96.5 (88.0-106)	103 (90.3-113)	152 (137-181)	233 (200-274)	283 (258-316)	317
Mexican Americans (2013 - 2014)	106 (90.8-124)	106 (93.0-125)	173 (140-209)	255 (198-303)	295 (249-402)	453
Mexican Americans (2015 - 2016)	91.4 (81.4-103)	97.4 (86.0-114)	156 (128-186)	230 (196-269)	284 (236-346)	584
Non-Hispanic blacks (2011 - 2012)	58.2 (53.8-63.0)	64.7 (60.3-68.3)	97.8 (89.3-108)	143 (130-160)	172 (149-216)	669
Non-Hispanic blacks (2013 - 2014)	56.1 (51.9-60.7)	60.4 (55.3-65.1)	91.7 (82.6-104)	135 (125-160)	187 (150-220)	581
Non-Hispanic blacks (2015 - 2016)	60.4 (55.9-65.3)	65.2 (56.8-70.9)	105 (93.9-119)	153 (141-177)	203 (172-228)	669
Non-Hispanic whites (2011 - 2012)	105 (94.3-118)	109 (95.1-118)	168 (148-200)	255 (235-295)	341 (313-367)	817
Non-Hispanic whites (2013 - 2014)	98.5 (93.0-104)	104 (97.7-110)	150 (142-159)	223 (193-255)	286 (251-314)	984
Non-Hispanic whites (2015 - 2016)	104 (96.8-111)	108 (100-114)	157 (147-168)	213 (195-238)	277 (247-311)	924
All Hispanics (2011 - 2012)	95.8 (87.5-105)	102 (92.4-112)	150 (136-172)	213 (195-240)	274 (222-315)	573
All Hispanics (2013 - 2014)	101 (86.9-117)	103 (89.4-122)	163 (136-198)	248 (195-291)	293 (237-402)	701
All Hispanics (2015 - 2016)	92.8 (83.7-103)	98.7 (88.2-110)	153 (132-176)	238 (201-274)	295 (251-345)	981
Asians (2011 - 2012)	130 (120-141)	132 (117-142)	197 (179-217)	295 (246-336)	405 (314-474)	353
Asians (2013 - 2014)	134 (121-148)	141 (120-156)	216 (182-265)	349 (274-395)	431 (359-457)	292
Asians (2015 - 2016)	120 (107-135)	126 (111-136)	198 (171-222)	301 (247-376)	388 (328-459)	332

Urinary Thallium (1999 – 2010)

CAS Number 7440-28-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.176 (.162-.192)	.200 (.180-.220)	.290 (.270-.330)	.400 (.370-.420)	.450 (.430-.480)	2413
Total population (2001 - 2002)	.165 (.154-.177)	.190 (.180-.200)	.280 (.260-.290)	.370 (.350-.390)	.440 (.410-.470)	2653
Total population (2003 - 2004)	.155 (.145-.165)	.170 (.160-.180)	.270 (.250-.290)	.370 (.340-.400)	.440 (.410-.490)	2558
Total population (2005 - 2006)	.158 (.151-.165)	.180 (.170-.190)	.270 (.260-.280)	.360 (.350-.390)	.430 (.410-.460)	2576
Total population (2007 - 2008)	.146 (.139-.153)	.160 (.150-.170)	.250 (.230-.260)	.330 (.320-.360)	.400 (.390-.420)	2627
Total population (2009 - 2010)	.144 (.137-.152)	.160 (.150-.170)	.240 (.230-.250)	.340 (.310-.360)	.410 (.380-.440)	2848
Age 6-11 years (1999 - 2000)	.201 (.167-.243)	.210 (.150-.280)	.310 (.250-.350)	.410 (.330-.450)	.450 (.350-.590)	336
Age 6-11 years (2001 - 2002)	.172 (.147-.202)	.200 (.160-.220)	.290 (.230-.330)	.350 (.340-.370)	.390 (.360-.430)	362
Age 6-11 years (2003 - 2004)	.191 (.170-.215)	.190 (.170-.230)	.300 (.250-.370)	.430 (.360-.500)	.510 (.430-.690)	290
Age 6-11 years (2005 - 2006)	.174 (.158-.192)	.190 (.170-.210)	.280 (.250-.300)	.380 (.320-.430)	.430 (.400-.480)	355
Age 6-11 years (2007 - 2008)	.166 (.150-.185)	.170 (.150-.200)	.250 (.230-.270)	.350 (.310-.410)	.420 (.360-.470)	394
Age 6-11 years (2009 - 2010)	.161 (.147-.176)	.170 (.150-.200)	.280 (.230-.310)	.360 (.330-.410)	.440 (.400-.460)	378
Age 12-19 years (1999 - 2000)	.202 (.181-.225)	.220 (.200-.240)	.300 (.270-.340)	.410 (.390-.430)	.470 (.430-.510)	697
Age 12-19 years (2001 - 2002)	.200 (.182-.220)	.220 (.190-.250)	.310 (.290-.320)	.370 (.350-.420)	.470 (.400-.500)	746
Age 12-19 years (2003 - 2004)	.201 (.185-.218)	.220 (.210-.240)	.310 (.290-.320)	.410 (.360-.470)	.500 (.420-.560)	725
Age 12-19 years (2005 - 2006)	.182 (.165-.200)	.210 (.190-.230)	.290 (.270-.310)	.370 (.350-.400)	.430 (.390-.480)	701
Age 12-19 years (2007 - 2008)	.172 (.155-.190)	.180 (.160-.210)	.270 (.230-.300)	.330 (.310-.350)	.390 (.340-.420)	376
Age 12-19 years (2009 - 2010)	.150 (.137-.163)	.160 (.150-.180)	.250 (.240-.270)	.340 (.290-.380)	.400 (.350-.430)	451
Age 20+ years (1999 - 2000)	.170 (.157-.183)	.190 (.180-.210)	.290 (.260-.320)	.400 (.370-.420)	.450 (.420-.480)	1380
Age 20+ years (2001 - 2002)	.159 (.147-.173)	.190 (.170-.200)	.270 (.250-.290)	.380 (.350-.400)	.440 (.410-.490)	1545
Age 20+ years (2003 - 2004)	.145 (.134-.156)	.160 (.150-.170)	.250 (.240-.270)	.360 (.330-.390)	.420 (.390-.460)	1543
Age 20+ years (2005 - 2006)	.152 (.144-.161)	.170 (.160-.180)	.260 (.240-.270)	.360 (.340-.390)	.440 (.400-.470)	1520
Age 20+ years (2007 - 2008)	.140 (.133-.148)	.150 (.140-.160)	.240 (.230-.250)	.330 (.310-.360)	.400 (.380-.440)	1857
Age 20+ years (2009 - 2010)	.142 (.133-.150)	.160 (.150-.170)	.240 (.220-.250)	.330 (.310-.360)	.410 (.370-.440)	2019
Males (1999 - 2000)	.197 (.179-.217)	.220 (.200-.240)	.320 (.280-.350)	.400 (.370-.440)	.450 (.420-.520)	1200
Males (2001 - 2002)	.184 (.173-.196)	.210 (.200-.230)	.290 (.280-.300)	.380 (.360-.400)	.430 (.400-.470)	1313
Males (2003 - 2004)	.167 (.156-.178)	.190 (.180-.200)	.280 (.260-.300)	.370 (.340-.400)	.430 (.400-.480)	1281
Males (2005 - 2006)	.171 (.163-.179)	.190 (.180-.200)	.270 (.260-.280)	.370 (.360-.390)	.430 (.410-.470)	1271
Males (2007 - 2008)	.154 (.148-.161)	.170 (.160-.180)	.250 (.240-.270)	.340 (.320-.360)	.390 (.380-.440)	1327
Males (2009 - 2010)	.152 (.140-.164)	.170 (.150-.180)	.250 (.240-.270)	.330 (.310-.360)	.410 (.360-.440)	1398
Females (1999 - 2000)	.159 (.145-.175)	.180 (.150-.200)	.270 (.250-.300)	.390 (.350-.420)	.460 (.410-.490)	1213
Females (2001 - 2002)	.149 (.137-.163)	.160 (.150-.180)	.260 (.230-.290)	.370 (.330-.400)	.440 (.400-.500)	1340
Females (2003 - 2004)	.144 (.133-.156)	.160 (.140-.170)	.250 (.230-.280)	.370 (.330-.410)	.450 (.410-.510)	1277
Females (2005 - 2006)	.146 (.138-.155)	.160 (.150-.180)	.260 (.240-.270)	.360 (.350-.380)	.440 (.400-.460)	1305
Females (2007 - 2008)	.139 (.129-.148)	.150 (.130-.160)	.240 (.220-.260)	.330 (.300-.390)	.410 (.380-.430)	1300
Females (2009 - 2010)	.137 (.129-.146)	.150 (.140-.160)	.230 (.210-.250)	.340 (.310-.360)	.410 (.380-.450)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.02, 0.02, 0.02, 0.015, 0.015, and 0.015 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Thallium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Thallium_FactSheet.html

Urinary Thallium (1999 – 2010)

CAS Number 7440-28-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.172 (.150-.196)	.200 (.160-.230)	.270 (.250-.300)	.370 (.320-.420)	.450 (.370-.520)	861
Mexican Americans (2001 - 2002)	.160 (.148-.173)	.180 (.160-.200)	.260 (.240-.270)	.340 (.310-.360)	.400 (.350-.440)	675
Mexican Americans (2003 - 2004)	.171 (.160-.183)	.200 (.170-.220)	.280 (.260-.310)	.360 (.340-.420)	.450 (.390-.480)	618
Mexican Americans (2005 - 2006)	.158 (.149-.167)	.180 (.170-.190)	.250 (.240-.270)	.330 (.300-.360)	.400 (.360-.440)	652
Mexican Americans (2007 - 2008)	.151 (.140-.164)	.170 (.150-.180)	.250 (.220-.270)	.330 (.310-.360)	.380 (.350-.390)	515
Mexican Americans (2009 - 2010)	.147 (.139-.155)	.160 (.150-.180)	.240 (.210-.260)	.310 (.290-.320)	.390 (.320-.430)	613
Non-Hispanic blacks (1999 - 2000)	.217 (.197-.239)	.230 (.220-.260)	.350 (.300-.390)	.450 (.400-.520)	.550 (.460-.630)	561
Non-Hispanic blacks (2001 - 2002)	.202 (.187-.218)	.220 (.200-.230)	.300 (.270-.340)	.410 (.380-.440)	.520 (.440-.590)	657
Non-Hispanic blacks (2003 - 2004)	.185 (.167-.206)	.190 (.170-.220)	.290 (.250-.330)	.410 (.330-.490)	.490 (.410-.640)	723
Non-Hispanic blacks (2005 - 2006)	.188 (.169-.210)	.210 (.180-.230)	.300 (.270-.320)	.390 (.360-.440)	.500 (.430-.530)	692
Non-Hispanic blacks (2007 - 2008)	.171 (.160-.182)	.180 (.170-.190)	.270 (.250-.290)	.350 (.330-.390)	.430 (.390-.460)	589
Non-Hispanic blacks (2009 - 2010)	.162 (.148-.177)	.180 (.160-.200)	.270 (.250-.280)	.350 (.330-.400)	.450 (.390-.510)	544
Non-Hispanic whites (1999 - 2000)	.170 (.153-.188)	.200 (.170-.220)	.290 (.260-.330)	.400 (.360-.420)	.450 (.420-.480)	801
Non-Hispanic whites (2001 - 2002)	.159 (.147-.172)	.180 (.170-.200)	.270 (.250-.290)	.360 (.330-.390)	.430 (.390-.460)	1114
Non-Hispanic whites (2003 - 2004)	.146 (.135-.158)	.160 (.150-.170)	.260 (.240-.280)	.360 (.330-.380)	.410 (.380-.460)	1074
Non-Hispanic whites (2005 - 2006)	.150 (.140-.160)	.170 (.160-.180)	.260 (.240-.270)	.350 (.320-.380)	.420 (.390-.450)	1041
Non-Hispanic whites (2007 - 2008)	.138 (.130-.147)	.150 (.130-.160)	.240 (.220-.260)	.320 (.300-.360)	.390 (.350-.440)	1095
Non-Hispanic whites (2009 - 2010)	.139 (.130-.149)	.150 (.140-.170)	.240 (.210-.250)	.330 (.300-.360)	.400 (.360-.430)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.02, 0.02, 0.02, 0.015, 0.015, and 0.015 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Thallium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Thallium_FactSheet.html

Urinary Thallium (2011 – 2016)

CAS Number 7440-28-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.149 (.138-.160)	.157 (.144-.169)	.255 (.232-.278)	.361 (.334-.377)	.434 (.379-.521)	2504
Total population (2013 - 2014)	.141 (.132-.150)	.154 (.139-.163)	.248 (.228-.266)	.349 (.338-.370)	.421 (.414-.438)	2664
Total population (2015 - 2016)	.153 (.143-.163)	.161 (.149-.177)	.255 (.234-.275)	.362 (.330-.385)	.435 (.403-.466)	3061
Age 3-5 years (2015 - 2016)	.150 (.137-.163)	.159 (.142-.178)	.251 (.218-.275)	.347 (.315-.388)	.432 (.353-.500)	486
Age 6-11 years (2011 - 2012)	.157 (.143-.172)	.157 (.136-.195)	.272 (.232-.308)	.365 (.330-.474)	.509 (.372-.629)	399
Age 6-11 years (2013 - 2014)	.149 (.131-.170)	.163 (.146-.173)	.259 (.221-.282)	.364 (.331-.400)	.438 (.367-.577)	402
Age 6-11 years (2015 - 2016)	.168 (.151-.186)	.172 (.150-.209)	.276 (.234-.306)	.363 (.314-.420)	.452 (.369-.574)	379
Age 12-19 years (2011 - 2012)	.155 (.131-.184)	.169 (.141-.196)	.288 (.240-.301)	.376 (.320-.403)	.447 (.387-.545)	390
Age 12-19 years (2013 - 2014)	.160 (.136-.188)	.170 (.154-.191)	.274 (.224-.334)	.400 (.324-.507)	.495 (.384-.562)	451
Age 12-19 years (2015 - 2016)	.168 (.150-.187)	.186 (.163-.203)	.248 (.221-.300)	.368 (.295-.428)	.437 (.368-.515)	402
Age 20+ years (2011 - 2012)	.147 (.136-.159)	.155 (.142-.167)	.247 (.223-.274)	.356 (.324-.377)	.431 (.375-.520)	1715
Age 20+ years (2013 - 2014)	.137 (.129-.146)	.150 (.136-.161)	.241 (.222-.262)	.340 (.326-.364)	.417 (.398-.426)	1811
Age 20+ years (2015 - 2016)	.149 (.140-.160)	.157 (.144-.173)	.255 (.234-.268)	.358 (.328-.379)	.433 (.395-.464)	1794
Males (2011 - 2012)	.165 (.150-.181)	.173 (.151-.195)	.272 (.239-.301)	.369 (.343-.387)	.431 (.381-.524)	1262
Males (2013 - 2014)	.147 (.136-.159)	.161 (.151-.171)	.258 (.231-.274)	.356 (.325-.381)	.422 (.400-.455)	1318
Males (2015 - 2016)	.163 (.155-.172)	.181 (.168-.195)	.267 (.248-.288)	.366 (.334-.394)	.440 (.394-.477)	1524
Females (2011 - 2012)	.135 (.122-.148)	.141 (.131-.155)	.237 (.208-.260)	.348 (.304-.376)	.434 (.367-.522)	1242
Females (2013 - 2014)	.135 (.125-.145)	.143 (.127-.160)	.241 (.214-.262)	.348 (.328-.373)	.421 (.398-.443)	1346
Females (2015 - 2016)	.143 (.131-.156)	.146 (.132-.163)	.236 (.208-.262)	.352 (.311-.385)	.432 (.388-.470)	1537
Mexican Americans (2011 - 2012)	.142 (.135-.150)	.162 (.143-.174)	.231 (.210-.248)	.298 (.268-.321)	.344 (.306-.381)	317
Mexican Americans (2013 - 2014)	.139 (.127-.154)	.157 (.137-.175)	.247 (.206-.274)	.324 (.285-.387)	.414 (.324-.511)	453
Mexican Americans (2015 - 2016)	.162 (.145-.181)	.180 (.150-.210)	.270 (.247-.288)	.349 (.309-.406)	.419 (.349-.492)	585
Non-Hispanic blacks (2011 - 2012)	.176 (.150-.206)	.184 (.158-.214)	.294 (.244-.364)	.431 (.370-.503)	.524 (.429-.657)	669
Non-Hispanic blacks (2013 - 2014)	.172 (.156-.189)	.190 (.170-.213)	.271 (.241-.301)	.356 (.325-.380)	.415 (.375-.433)	581
Non-Hispanic blacks (2015 - 2016)	.170 (.156-.186)	.183 (.171-.197)	.279 (.260-.296)	.364 (.338-.393)	.443 (.414-.494)	671
Non-Hispanic whites (2011 - 2012)	.143 (.133-.155)	.149 (.135-.166)	.245 (.218-.277)	.353 (.322-.372)	.412 (.367-.522)	820
Non-Hispanic whites (2013 - 2014)	.132 (.120-.145)	.139 (.121-.161)	.235 (.203-.265)	.340 (.318-.370)	.419 (.392-.440)	985
Non-Hispanic whites (2015 - 2016)	.143 (.132-.155)	.151 (.139-.166)	.236 (.209-.259)	.336 (.298-.379)	.414 (.369-.459)	924
All Hispanics (2011 - 2012)	.145 (.134-.157)	.158 (.148-.169)	.237 (.219-.257)	.305 (.289-.340)	.381 (.326-.438)	573
All Hispanics (2013 - 2014)	.144 (.130-.160)	.160 (.138-.178)	.251 (.220-.272)	.340 (.291-.382)	.417 (.365-.473)	701
All Hispanics (2015 - 2016)	.159 (.148-.170)	.174 (.157-.197)	.263 (.248-.280)	.351 (.319-.394)	.419 (.388-.466)	982
Asians (2011 - 2012)	.177 (.160-.197)	.183 (.163-.214)	.292 (.255-.319)	.417 (.372-.489)	.541 (.431-.664)	353
Asians (2013 - 2014)	.154 (.140-.169)	.159 (.134-.184)	.268 (.239-.310)	.414 (.368-.438)	.502 (.421-.662)	292
Asians (2015 - 2016)	.190 (.175-.206)	.213 (.189-.241)	.348 (.306-.371)	.483 (.413-.543)	.551 (.514-.595)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.02, 0.018, and 0.018, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Thallium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Thallium_FactSheet.html

Urinary Thallium (creatinine corrected) (1999 – 2010)

CAS Number 7440-28-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.166 (.159-.173)	.168 (.162-.176)	.224 (.217-.233)	.297 (.273-.319)	.366 (.338-.387)	2413
Total population (2001 - 2002)	.156 (.151-.162)	.156 (.148-.164)	.215 (.208-.222)	.287 (.278-.300)	.349 (.337-.365)	2652
Total population (2003 - 2004)	.154 (.149-.158)	.153 (.146-.160)	.214 (.203-.222)	.286 (.274-.304)	.350 (.328-.369)	2558
Total population (2005 - 2006)	.155 (.149-.162)	.150 (.140-.160)	.210 (.200-.220)	.300 (.290-.320)	.370 (.350-.390)	2576
Total population (2007 - 2008)	.152 (.147-.158)	.150 (.140-.160)	.210 (.200-.220)	.290 (.280-.310)	.370 (.350-.380)	2627
Total population (2009 - 2010)	.153 (.145-.162)	.150 (.140-.160)	.220 (.200-.230)	.300 (.280-.320)	.370 (.350-.400)	2848
Age 6-11 years (1999 - 2000)	.221 (.197-.248)	.222 (.196-.236)	.297 (.229-.356)	.375 (.318-.469)	.424 (.356-.600)	336
Age 6-11 years (2001 - 2002)	.211 (.198-.226)	.207 (.198-.221)	.286 (.260-.321)	.370 (.333-.402)	.412 (.389-.456)	362
Age 6-11 years (2003 - 2004)	.223 (.208-.238)	.216 (.198-.229)	.306 (.280-.346)	.412 (.346-.458)	.458 (.400-.532)	290
Age 6-11 years (2005 - 2006)	.215 (.200-.231)	.210 (.190-.250)	.310 (.270-.320)	.360 (.320-.410)	.430 (.360-.510)	355
Age 6-11 years (2007 - 2008)	.217 (.201-.234)	.220 (.210-.240)	.310 (.270-.340)	.410 (.370-.440)	.470 (.410-.540)	394
Age 6-11 years (2009 - 2010)	.219 (.199-.241)	.220 (.200-.260)	.300 (.280-.340)	.400 (.350-.440)	.500 (.390-.600)	378
Age 12-19 years (1999 - 2000)	.153 (.146-.160)	.154 (.146-.162)	.205 (.191-.219)	.258 (.231-.278)	.321 (.265-.364)	697
Age 12-19 years (2001 - 2002)	.143 (.137-.150)	.145 (.135-.152)	.196 (.184-.207)	.272 (.250-.289)	.312 (.299-.333)	746
Age 12-19 years (2003 - 2004)	.143 (.135-.152)	.146 (.131-.155)	.194 (.179-.208)	.254 (.234-.280)	.304 (.271-.327)	725
Age 12-19 years (2005 - 2006)	.140 (.133-.147)	.140 (.130-.150)	.190 (.170-.200)	.240 (.220-.270)	.290 (.250-.310)	701
Age 12-19 years (2007 - 2008)	.134 (.124-.145)	.140 (.120-.150)	.190 (.180-.220)	.260 (.220-.300)	.300 (.250-.370)	376
Age 12-19 years (2009 - 2010)	.140 (.127-.155)	.140 (.120-.160)	.190 (.170-.220)	.260 (.220-.310)	.310 (.260-.370)	451
Age 20+ years (1999 - 2000)	.162 (.153-.171)	.167 (.155-.176)	.218 (.207-.230)	.286 (.271-.300)	.364 (.325-.389)	1380
Age 20+ years (2001 - 2002)	.153 (.147-.159)	.153 (.144-.161)	.210 (.200-.217)	.278 (.263-.293)	.343 (.313-.362)	1544
Age 20+ years (2003 - 2004)	.148 (.144-.153)	.149 (.141-.156)	.206 (.192-.215)	.273 (.258-.289)	.333 (.306-.353)	1543
Age 20+ years (2005 - 2006)	.152 (.145-.159)	.150 (.140-.160)	.210 (.200-.210)	.290 (.270-.310)	.370 (.350-.400)	1520
Age 20+ years (2007 - 2008)	.149 (.143-.156)	.150 (.140-.160)	.210 (.200-.220)	.280 (.270-.300)	.350 (.330-.380)	1857
Age 20+ years (2009 - 2010)	.150 (.142-.157)	.150 (.140-.160)	.210 (.200-.220)	.290 (.270-.320)	.370 (.330-.400)	2019
Males (1999 - 2000)	.154 (.147-.161)	.156 (.149-.164)	.202 (.192-.214)	.269 (.254-.297)	.338 (.300-.364)	1200
Males (2001 - 2002)	.146 (.140-.153)	.148 (.142-.157)	.192 (.184-.204)	.260 (.246-.278)	.307 (.291-.342)	1312
Males (2003 - 2004)	.140 (.135-.146)	.142 (.134-.149)	.188 (.180-.198)	.264 (.235-.286)	.317 (.287-.350)	1281
Males (2005 - 2006)	.140 (.134-.147)	.140 (.130-.140)	.190 (.180-.200)	.270 (.240-.300)	.320 (.300-.340)	1271
Males (2007 - 2008)	.138 (.131-.145)	.130 (.130-.140)	.190 (.180-.210)	.270 (.250-.290)	.330 (.300-.360)	1327
Males (2009 - 2010)	.138 (.129-.148)	.130 (.130-.150)	.190 (.170-.210)	.270 (.240-.300)	.330 (.290-.360)	1398
Females (1999 - 2000)	.178 (.167-.189)	.182 (.169-.197)	.244 (.226-.259)	.317 (.281-.366)	.380 (.333-.462)	1213
Females (2001 - 2002)	.167 (.158-.176)	.167 (.153-.180)	.233 (.217-.250)	.313 (.282-.348)	.378 (.348-.402)	1340
Females (2003 - 2004)	.167 (.162-.173)	.166 (.157-.177)	.235 (.222-.243)	.313 (.286-.333)	.368 (.340-.412)	1277
Females (2005 - 2006)	.171 (.162-.181)	.170 (.160-.180)	.230 (.220-.250)	.330 (.300-.360)	.430 (.370-.490)	1305
Females (2007 - 2008)	.167 (.163-.173)	.170 (.160-.180)	.230 (.230-.240)	.320 (.300-.340)	.390 (.360-.430)	1300
Females (2009 - 2010)	.170 (.161-.178)	.170 (.160-.180)	.230 (.220-.250)	.340 (.310-.370)	.420 (.370-.470)	1450

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Thallium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Thallium_Factsheet.html

Urinary Thallium (creatinine corrected) (1999 – 2010)

CAS Number 7440-28-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.158 (.147-.170)	.160 (.148-.176)	.213 (.200-.237)	.282 (.266-.304)	.343 (.306-.389)	861
Mexican Americans (2001 - 2002)	.156 (.145-.169)	.155 (.145-.167)	.204 (.191-.221)	.286 (.250-.317)	.361 (.301-.424)	674
Mexican Americans (2003 - 2004)	.159 (.148-.170)	.157 (.143-.172)	.211 (.187-.241)	.293 (.273-.324)	.369 (.326-.422)	618
Mexican Americans (2005 - 2006)	.149 (.139-.158)	.150 (.140-.160)	.200 (.180-.210)	.270 (.240-.290)	.320 (.280-.370)	652
Mexican Americans (2007 - 2008)	.151 (.143-.160)	.160 (.130-.170)	.200 (.190-.220)	.270 (.250-.280)	.320 (.290-.370)	515
Mexican Americans (2009 - 2010)	.154 (.141-.167)	.150 (.140-.170)	.210 (.180-.230)	.280 (.250-.330)	.360 (.310-.430)	613
Non-Hispanic blacks (1999 - 2000)	.142 (.133-.152)	.140 (.129-.151)	.200 (.184-.214)	.278 (.244-.307)	.383 (.286-.462)	561
Non-Hispanic blacks (2001 - 2002)	.138 (.128-.150)	.136 (.125-.146)	.194 (.170-.212)	.256 (.238-.278)	.328 (.271-.387)	657
Non-Hispanic blacks (2003 - 2004)	.133 (.122-.145)	.128 (.119-.143)	.185 (.171-.200)	.255 (.237-.269)	.323 (.267-.377)	723
Non-Hispanic blacks (2005 - 2006)	.137 (.128-.145)	.130 (.130-.140)	.190 (.180-.200)	.240 (.220-.290)	.320 (.270-.370)	692
Non-Hispanic blacks (2007 - 2008)	.125 (.118-.132)	.130 (.120-.130)	.170 (.160-.180)	.230 (.210-.260)	.280 (.250-.330)	589
Non-Hispanic blacks (2009 - 2010)	.128 (.120-.137)	.120 (.110-.130)	.180 (.160-.210)	.250 (.230-.280)	.310 (.270-.350)	544
Non-Hispanic whites (1999 - 2000)	.169 (.160-.179)	.173 (.167-.181)	.227 (.215-.240)	.300 (.272-.329)	.364 (.333-.377)	801
Non-Hispanic whites (2001 - 2002)	.161 (.155-.167)	.161 (.153-.171)	.222 (.214-.231)	.292 (.278-.304)	.348 (.330-.383)	1114
Non-Hispanic whites (2003 - 2004)	.154 (.148-.160)	.153 (.143-.162)	.214 (.200-.223)	.283 (.271-.304)	.333 (.313-.363)	1074
Non-Hispanic whites (2005 - 2006)	.156 (.148-.164)	.150 (.140-.160)	.210 (.200-.230)	.300 (.280-.320)	.360 (.330-.400)	1041
Non-Hispanic whites (2007 - 2008)	.154 (.146-.164)	.160 (.140-.170)	.220 (.210-.230)	.300 (.280-.320)	.370 (.340-.390)	1095
Non-Hispanic whites (2009 - 2010)	.155 (.145-.166)	.150 (.140-.170)	.220 (.200-.240)	.310 (.280-.330)	.380 (.340-.410)	1225

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Thallium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Thallium_FactSheet.html

Urinary Thallium (creatinine corrected) (2011 – 2016)

CAS Number 7440-28-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.168 (.157-.180)	.167 (.156-.178)	.235 (.216-.253)	.337 (.310-.365)	.425 (.369-.497)	2502
Total population (2013 - 2014)	.162 (.155-.171)	.161 (.151-.169)	.236 (.228-.245)	.338 (.321-.351)	.429 (.405-.444)	2663
Total population (2015 - 2016)	.171 (.163-.181)	.169 (.158-.180)	.243 (.226-.270)	.348 (.321-.384)	.432 (.402-.471)	3058
Age 3-5 years (2015 - 2016)	.344 (.330-.358)	.342 (.328-.358)	.474 (.436-.507)	.643 (.587-.717)	.850 (.682-.972)	485
Age 6-11 years (2011 - 2012)	.223 (.209-.238)	.216 (.200-.241)	.301 (.275-.336)	.395 (.371-.440)	.486 (.422-.568)	398
Age 6-11 years (2013 - 2014)	.222 (.199-.249)	.227 (.215-.255)	.318 (.279-.360)	.429 (.386-.458)	.502 (.457-.537)	402
Age 6-11 years (2015 - 2016)	.238 (.223-.253)	.232 (.216-.257)	.335 (.312-.359)	.450 (.418-.496)	.524 (.485-.593)	379
Age 12-19 years (2011 - 2012)	.149 (.134-.165)	.147 (.130-.169)	.200 (.180-.218)	.276 (.235-.321)	.339 (.268-.500)	390
Age 12-19 years (2013 - 2014)	.145 (.133-.158)	.141 (.131-.160)	.213 (.182-.231)	.276 (.237-.301)	.315 (.283-.361)	451
Age 12-19 years (2015 - 2016)	.157 (.145-.169)	.161 (.144-.175)	.222 (.191-.244)	.290 (.262-.329)	.351 (.289-.410)	402
Age 20+ years (2011 - 2012)	.166 (.155-.179)	.164 (.154-.175)	.233 (.212-.250)	.333 (.298-.367)	.436 (.365-.510)	1714
Age 20+ years (2013 - 2014)	.160 (.153-.168)	.157 (.148-.165)	.229 (.222-.241)	.333 (.313-.352)	.429 (.394-.457)	1810
Age 20+ years (2015 - 2016)	.163 (.153-.174)	.159 (.148-.173)	.231 (.207-.256)	.323 (.288-.362)	.400 (.358-.444)	1792
Males (2011 - 2012)	.154 (.142-.167)	.155 (.144-.165)	.211 (.197-.233)	.292 (.258-.326)	.353 (.312-.385)	1261
Males (2013 - 2014)	.147 (.137-.158)	.141 (.133-.150)	.206 (.194-.222)	.295 (.272-.315)	.368 (.341-.414)	1317
Males (2015 - 2016)	.155 (.145-.166)	.150 (.138-.167)	.220 (.199-.247)	.322 (.298-.348)	.396 (.358-.449)	1524
Females (2011 - 2012)	.183 (.172-.195)	.180 (.168-.193)	.261 (.240-.286)	.382 (.349-.420)	.480 (.422-.510)	1241
Females (2013 - 2014)	.179 (.172-.187)	.180 (.171-.190)	.264 (.248-.274)	.374 (.352-.402)	.439 (.416-.482)	1346
Females (2015 - 2016)	.188 (.179-.199)	.187 (.175-.199)	.265 (.243-.283)	.379 (.339-.408)	.458 (.418-.517)	1534
Mexican Americans (2011 - 2012)	.160 (.150-.170)	.163 (.141-.175)	.222 (.198-.245)	.295 (.276-.326)	.359 (.302-.440)	317
Mexican Americans (2013 - 2014)	.159 (.151-.168)	.151 (.142-.162)	.218 (.194-.230)	.313 (.282-.350)	.409 (.350-.457)	453
Mexican Americans (2015 - 2016)	.178 (.165-.192)	.178 (.158-.199)	.241 (.217-.278)	.369 (.316-.403)	.455 (.406-.513)	584
Non-Hispanic blacks (2011 - 2012)	.137 (.119-.157)	.137 (.113-.159)	.208 (.174-.244)	.284 (.248-.334)	.348 (.293-.406)	669
Non-Hispanic blacks (2013 - 2014)	.131 (.125-.137)	.126 (.117-.138)	.181 (.171-.189)	.254 (.232-.276)	.324 (.265-.421)	581
Non-Hispanic blacks (2015 - 2016)	.135 (.126-.145)	.130 (.119-.138)	.194 (.181-.212)	.304 (.270-.339)	.369 (.333-.412)	669
Non-Hispanic whites (2011 - 2012)	.173 (.161-.186)	.171 (.161-.181)	.235 (.213-.261)	.337 (.309-.373)	.453 (.357-.521)	818
Non-Hispanic whites (2013 - 2014)	.163 (.151-.176)	.163 (.149-.176)	.242 (.226-.255)	.338 (.309-.362)	.430 (.390-.482)	984
Non-Hispanic whites (2015 - 2016)	.169 (.157-.182)	.168 (.154-.180)	.239 (.213-.276)	.336 (.300-.369)	.404 (.371-.450)	924
All Hispanics (2011 - 2012)	.162 (.150-.176)	.158 (.142-.174)	.221 (.198-.250)	.304 (.278-.347)	.370 (.316-.440)	573
All Hispanics (2013 - 2014)	.161 (.153-.170)	.154 (.145-.164)	.222 (.208-.238)	.318 (.294-.344)	.386 (.350-.432)	701
All Hispanics (2015 - 2016)	.180 (.170-.190)	.178 (.167-.190)	.241 (.225-.266)	.366 (.332-.389)	.444 (.424-.509)	981
Asians (2011 - 2012)	.237 (.219-.256)	.228 (.206-.250)	.337 (.297-.367)	.526 (.442-.586)	.663 (.557-.830)	353
Asians (2013 - 2014)	.242 (.221-.264)	.237 (.216-.268)	.352 (.304-.382)	.456 (.417-.529)	.570 (.460-.857)	292
Asians (2015 - 2016)	.259 (.242-.278)	.254 (.234-.279)	.368 (.333-.406)	.536 (.492-.603)	.663 (.572-.742)	332

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Thallium_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Thallium_FactSheet.html

Urinary Tin (2011 – 2016)

CAS Number 7440-31-5

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.621 (.569-.678)	.530 (.470-.590)	1.16 (.990-1.35)	2.94 (2.43-3.44)	4.74 (4.07-5.90)	2504
Total population (2013 - 2014)	.433 (.374-.500)	.380 (.330-.440)	.930 (.790-1.16)	2.30 (2.02-2.67)	4.14 (3.12-5.46)	2664
Total population (2015 - 2016)	.495 (.446-.549)	.470 (.400-.530)	1.05 (.950-1.19)	2.42 (2.10-2.58)	4.36 (3.62-4.93)	3060
Age 3-5 years (2015 - 2016)	1.14 (1.01-1.28)	1.06 (.890-1.24)	2.93 (2.33-3.28)	5.96 (4.72-9.06)	11.3 (7.41-16.4)	486
Age 6-11 years (2011 - 2012)	1.17 (.985-1.39)	1.12 (.820-1.43)	2.61 (2.24-2.95)	5.07 (3.44-7.29)	8.05 (5.07-12.7)	399
Age 6-11 years (2013 - 2014)	.867 (.702-1.07)	.850 (.650-1.15)	2.16 (1.67-2.92)	5.16 (3.23-6.49)	7.25 (5.03-9.48)	402
Age 6-11 years (2015 - 2016)	.873 (.748-1.02)	.850 (.660-1.07)	1.84 (1.57-2.17)	4.08 (2.70-5.02)	5.70 (4.40-9.77)	379
Age 12-19 years (2011 - 2012)	.585 (.497-.688)	.470 (.380-.610)	1.21 (.880-1.60)	2.68 (1.92-3.65)	4.18 (3.19-4.93)	390
Age 12-19 years (2013 - 2014)	.404 (.320-.511)	.370 (.290-.490)	.940 (.690-1.21)	2.02 (1.41-2.86)	3.19 (2.28-4.14)	451
Age 12-19 years (2015 - 2016)	.485 (.447-.526)	.410 (.360-.480)	.980 (.810-1.15)	2.31 (1.72-2.79)	4.31 (2.52-5.17)	402
Age 20+ years (2011 - 2012)	.585 (.521-.656)	.510 (.450-.580)	1.02 (.870-1.24)	2.58 (2.09-3.40)	4.46 (3.46-5.97)	1715
Age 20+ years (2013 - 2014)	.406 (.352-.469)	.360 (.320-.410)	.830 (.730-1.00)	2.16 (1.73-2.38)	3.40 (2.80-4.84)	1811
Age 20+ years (2015 - 2016)	.452 (.402-.508)	.430 (.360-.510)	.950 (.840-1.07)	2.09 (1.79-2.52)	3.62 (2.76-4.59)	1793
Males (2011 - 2012)	.622 (.550-.704)	.530 (.470-.590)	1.11 (.930-1.28)	3.02 (2.27-3.84)	4.89 (3.65-6.72)	1262
Males (2013 - 2014)	.414 (.360-.476)	.360 (.320-.420)	.840 (.720-1.01)	2.25 (1.70-2.81)	4.47 (3.15-5.57)	1318
Males (2015 - 2016)	.479 (.414-.554)	.460 (.360-.540)	.970 (.820-1.19)	2.22 (1.76-2.70)	3.88 (2.82-4.92)	1524
Females (2011 - 2012)	.620 (.558-.690)	.550 (.460-.620)	1.22 (.990-1.45)	2.77 (2.29-3.36)	4.59 (3.98-5.54)	1242
Females (2013 - 2014)	.451 (.376-.541)	.410 (.350-.470)	1.05 (.830-1.34)	2.36 (1.97-2.92)	3.90 (2.99-5.21)	1346
Females (2015 - 2016)	.511 (.457-.570)	.480 (.410-.540)	1.14 (.990-1.30)	2.52 (2.20-2.86)	4.76 (3.86-5.17)	1536
Mexican Americans (2011 - 2012)	.644 (.527-.786)	.580 (.430-.700)	1.08 (.830-1.43)	2.66 (1.88-4.41)	5.54 (3.10-8.30)	317
Mexican Americans (2013 - 2014)	.410 (.314-.536)	.360 (.270-.490)	.890 (.680-1.24)	2.25 (1.39-3.26)	4.40 (2.31-6.11)	453
Mexican Americans (2015 - 2016)	.579 (.506-.663)	.550 (.450-.650)	1.21 (1.00-1.44)	2.52 (2.12-2.82)	3.65 (2.86-4.72)	585
Non-Hispanic blacks (2011 - 2012)	.950 (.825-1.09)	.860 (.740-1.00)	1.86 (1.63-2.16)	4.22 (3.28-5.55)	7.73 (4.93-12.4)	669
Non-Hispanic blacks (2013 - 2014)	.729 (.570-.932)	.720 (.520-.880)	1.50 (1.18-1.93)	3.60 (2.82-5.03)	6.79 (4.85-9.94)	581
Non-Hispanic blacks (2015 - 2016)	.728 (.681-.779)	.680 (.590-.770)	1.36 (1.26-1.52)	3.36 (2.70-4.07)	5.89 (4.36-8.08)	671
Non-Hispanic whites (2011 - 2012)	.579 (.513-.654)	.490 (.430-.570)	1.03 (.830-1.28)	2.72 (2.08-3.62)	4.53 (3.41-6.03)	820
Non-Hispanic whites (2013 - 2014)	.402 (.341-.473)	.350 (.310-.410)	.840 (.700-1.06)	2.20 (1.84-2.39)	3.39 (2.67-5.18)	985
Non-Hispanic whites (2015 - 2016)	.474 (.411-.547)	.440 (.360-.540)	1.00 (.850-1.30)	2.42 (2.00-2.70)	4.44 (3.08-5.23)	924
All Hispanics (2011 - 2012)	.642 (.575-.717)	.570 (.460-.640)	1.23 (.990-1.41)	2.77 (2.12-3.29)	4.57 (3.56-6.54)	573
All Hispanics (2013 - 2014)	.432 (.355-.526)	.410 (.330-.490)	.910 (.750-1.17)	2.25 (1.61-2.93)	4.22 (2.67-5.80)	701
All Hispanics (2015 - 2016)	.520 (.465-.581)	.500 (.430-.570)	1.05 (.850-1.22)	2.17 (1.89-2.57)	3.59 (2.82-4.72)	982
Asians (2011 - 2012)	.477 (.433-.526)	.400 (.350-.460)	.820 (.690-1.01)	2.00 (1.34-2.39)	2.58 (2.21-3.90)	353
Asians (2013 - 2014)	.270 (.216-.337)	.230 (.170-.310)	.570 (.400-.750)	1.31 (.810-1.83)	2.02 (1.54-3.56)	292
Asians (2015 - 2016)	.295 (.253-.345)	.270 (.220-.290)	.500 (.410-.560)	1.37 (.890-1.95)	3.11 (1.80-4.86)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.22, 0.09, and 0.09, respectively.

Urinary Tin (creatinine corrected) (2011 – 2016)

CAS Number 7440-31-5

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.705 (.653-.761)	.624 (.567-.678)	1.24 (1.11-1.34)	2.54 (2.29-2.80)	4.50 (3.76-5.33)	2502
Total population (2013 - 2014)	.499 (.436-.570)	.438 (.389-.510)	.995 (.826-1.14)	2.25 (1.99-2.64)	3.72 (3.17-4.48)	2663
Total population (2015 - 2016)	.555 (.500-.617)	.463 (.420-.518)	1.04 (.912-1.17)	2.26 (1.93-2.69)	4.18 (3.59-4.79)	3057
Age 3-5 years (2015 - 2016)	2.60 (2.30-2.95)	2.37 (1.93-2.78)	5.63 (4.42-6.66)	11.4 (9.24-14.3)	16.4 (12.3-21.9)	485
Age 6-11 years (2011 - 2012)	1.67 (1.46-1.90)	1.60 (1.44-1.73)	2.83 (2.61-3.31)	5.61 (4.50-7.22)	7.91 (6.11-12.1)	398
Age 6-11 years (2013 - 2014)	1.29 (1.07-1.57)	1.36 (1.00-1.64)	2.82 (2.22-3.25)	5.93 (3.80-7.26)	7.82 (6.17-13.4)	402
Age 6-11 years (2015 - 2016)	1.24 (1.08-1.42)	1.22 (1.03-1.38)	2.24 (1.87-2.46)	4.21 (3.16-7.19)	8.52 (4.98-12.1)	379
Age 12-19 years (2011 - 2012)	.559 (.475-.659)	.484 (.411-.543)	1.03 (.725-1.39)	1.97 (1.43-2.49)	2.80 (2.00-3.74)	390
Age 12-19 years (2013 - 2014)	.366 (.304-.441)	.347 (.254-.455)	.735 (.600-.870)	1.45 (1.16-1.77)	2.21 (1.48-3.03)	451
Age 12-19 years (2015 - 2016)	.453 (.404-.508)	.372 (.350-.412)	.805 (.670-.902)	1.86 (1.41-2.43)	2.74 (2.11-4.76)	402
Age 20+ years (2011 - 2012)	.665 (.599-.737)	.593 (.537-.663)	1.11 (.956-1.30)	2.32 (1.94-2.67)	4.04 (3.00-5.09)	1714
Age 20+ years (2013 - 2014)	.473 (.414-.539)	.417 (.372-.475)	.882 (.737-1.05)	1.96 (1.74-2.33)	3.32 (2.83-3.91)	1810
Age 20+ years (2015 - 2016)	.493 (.441-.550)	.431 (.390-.478)	.885 (.778-1.01)	1.69 (1.47-2.07)	3.06 (2.46-4.17)	1791
Males (2011 - 2012)	.584 (.524-.651)	.515 (.436-.576)	.966 (.875-1.12)	2.29 (1.86-2.80)	4.17 (2.80-5.55)	1261
Males (2013 - 2014)	.412 (.356-.477)	.353 (.302-.406)	.740 (.606-.949)	1.96 (1.64-2.30)	3.30 (2.73-4.65)	1317
Males (2015 - 2016)	.455 (.398-.520)	.387 (.326-.454)	.883 (.722-1.04)	1.85 (1.52-2.42)	3.33 (2.87-3.88)	1524
Females (2011 - 2012)	.843 (.772-.920)	.764 (.676-.857)	1.42 (1.21-1.72)	2.70 (2.51-3.19)	4.81 (3.50-5.59)	1241
Females (2013 - 2014)	.599 (.515-.697)	.557 (.491-.608)	1.19 (1.00-1.37)	2.58 (2.00-3.19)	4.00 (3.20-5.50)	1346
Females (2015 - 2016)	.672 (.609-.742)	.567 (.507-.640)	1.20 (1.04-1.38)	2.50 (2.24-2.97)	5.75 (4.15-6.69)	1533
Mexican Americans (2011 - 2012)	.724 (.599-.874)	.640 (.482-.785)	1.23 (1.00-1.72)	3.28 (2.27-4.17)	5.29 (3.28-7.22)	317
Mexican Americans (2013 - 2014)	.468 (.372-.588)	.394 (.294-.554)	.833 (.712-1.27)	2.19 (1.73-3.01)	3.29 (2.24-7.09)	453
Mexican Americans (2015 - 2016)	.636 (.534-.758)	.555 (.448-.647)	1.23 (.859-1.53)	3.04 (2.51-3.60)	5.02 (3.93-6.00)	584
Non-Hispanic blacks (2011 - 2012)	.739 (.648-.842)	.684 (.553-.802)	1.52 (1.27-1.79)	3.19 (2.66-3.91)	5.28 (3.47-7.90)	669
Non-Hispanic blacks (2013 - 2014)	.555 (.459-.670)	.495 (.401-.600)	1.10 (.989-1.40)	2.80 (2.04-3.62)	4.99 (3.31-7.26)	581
Non-Hispanic blacks (2015 - 2016)	.576 (.538-.616)	.507 (.474-.550)	1.06 (.892-1.22)	2.41 (2.05-2.89)	4.56 (3.31-6.07)	669
Non-Hispanic whites (2011 - 2012)	.701 (.636-.772)	.624 (.557-.683)	1.22 (1.06-1.39)	2.50 (2.06-2.79)	4.22 (2.94-5.35)	818
Non-Hispanic whites (2013 - 2014)	.494 (.418-.584)	.438 (.380-.527)	.970 (.787-1.16)	2.09 (1.76-2.73)	3.63 (2.83-5.50)	984
Non-Hispanic whites (2015 - 2016)	.559 (.488-.641)	.461 (.415-.556)	1.06 (.904-1.26)	2.19 (1.76-2.74)	4.18 (3.10-6.20)	924
All Hispanics (2011 - 2012)	.719 (.638-.810)	.640 (.543-.739)	1.23 (1.06-1.41)	3.18 (2.32-3.74)	4.51 (3.63-6.13)	573
All Hispanics (2013 - 2014)	.482 (.409-.568)	.401 (.337-.485)	.866 (.725-1.17)	2.31 (1.91-3.10)	4.04 (2.88-5.03)	701
All Hispanics (2015 - 2016)	.590 (.514-.677)	.492 (.423-.594)	1.04 (.824-1.37)	2.65 (2.23-3.14)	4.56 (3.59-5.52)	981
Asians (2011 - 2012)	.638 (.560-.727)	.543 (.503-.667)	1.00 (.867-1.17)	1.96 (1.49-2.36)	3.03 (2.23-3.58)	353
Asians (2013 - 2014)	.423 (.354-.506)	.369 (.305-.411)	.745 (.529-1.12)	1.98 (1.08-2.54)	2.73 (1.82-6.78)	292
Asians (2015 - 2016)	.403 (.359-.453)	.337 (.305-.373)	.643 (.569-.750)	1.37 (.935-1.98)	2.55 (1.69-5.77)	332

Urinary Tungsten (1999 – 2010)

CAS Number 7440-33-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.093 (.087-.100)	.090 (.080-.090)	.180 (.160-.190)	.320 (.280-.370)	.500 (.430-.550)	2338
Total population (2001 - 2002)	.082 (.073-.092)	.070 (.060-.090)	.160 (.140-.180)	.300 (.260-.350)	.460 (.370-.560)	2652
Total population (2003 - 2004)	.071 (.064-.078)	.070 (.060-.080)	.130 (.120-.140)	.270 (.230-.300)	.400 (.330-.480)	2558
Total population (2005 - 2006)	.085 (.079-.092)	.090 (.080-.090)	.170 (.150-.180)	.310 (.280-.340)	.470 (.400-.520)	2576
Total population (2007 - 2008)	.099 (.093-.105)	.100 (.090-.110)	.190 (.180-.200)	.360 (.320-.380)	.500 (.440-.570)	2627
Total population (2009 - 2010)	.081 (.075-.087)	.080 (.070-.090)	.160 (.150-.170)	.310 (.270-.330)	.460 (.370-.540)	2847
Age 6-11 years (1999 - 2000)	.158 (.123-.204)	.160 (.120-.220)	.270 (.220-.350)	.510 (.380-.560)	.620 (.510-.950)	320
Age 6-11 years (2001 - 2002)	.137 (.110-.170)	.140 (.110-.170)	.260 (.200-.350)	.460 (.360-.690)	.770 (.510-1.53)	363
Age 6-11 years (2003 - 2004)	.130 (.111-.151)	.140 (.120-.150)	.240 (.190-.290)	.410 (.290-.500)	.500 (.370-.630)	290
Age 6-11 years (2005 - 2006)	.142 (.121-.166)	.140 (.120-.170)	.230 (.210-.290)	.430 (.330-.610)	.640 (.440-.850)	355
Age 6-11 years (2007 - 2008)	.160 (.138-.186)	.150 (.130-.170)	.310 (.240-.390)	.510 (.450-.580)	.810 (.560-1.15)	394
Age 6-11 years (2009 - 2010)	.151 (.126-.180)	.150 (.110-.200)	.310 (.230-.400)	.560 (.400-.770)	.770 (.560-1.04)	378
Age 12-19 years (1999 - 2000)	.113 (.097-.132)	.110 (.090-.130)	.210 (.180-.250)	.360 (.310-.440)	.530 (.380-.800)	679
Age 12-19 years (2001 - 2002)	.113 (.095-.135)	.110 (.090-.130)	.210 (.180-.260)	.400 (.310-.520)	.570 (.430-.790)	744
Age 12-19 years (2003 - 2004)	.105 (.090-.122)	.100 (.090-.120)	.190 (.160-.230)	.350 (.290-.460)	.530 (.350-1.00)	725
Age 12-19 years (2005 - 2006)	.131 (.108-.158)	.130 (.100-.160)	.250 (.200-.310)	.430 (.360-.530)	.620 (.410-1.04)	701
Age 12-19 years (2007 - 2008)	.150 (.136-.167)	.160 (.140-.180)	.250 (.220-.290)	.470 (.350-.660)	.660 (.430-1.05)	376
Age 12-19 years (2009 - 2010)	.101 (.089-.115)	.100 (.080-.120)	.210 (.190-.240)	.360 (.300-.460)	.540 (.440-.650)	451
Age 20+ years (1999 - 2000)	.084 (.078-.091)	.080 (.070-.090)	.160 (.130-.180)	.280 (.260-.320)	.450 (.360-.520)	1339
Age 20+ years (2001 - 2002)	.073 (.065-.082)	.060 (.050-.070)	.140 (.110-.160)	.260 (.210-.310)	.380 (.310-.490)	1545
Age 20+ years (2003 - 2004)	.062 (.056-.068)	.060 (.050-.070)	.110 (.100-.120)	.210 (.180-.250)	.360 (.270-.430)	1543
Age 20+ years (2005 - 2006)	.075 (.070-.081)	.080 (.070-.080)	.140 (.130-.160)	.250 (.220-.310)	.410 (.340-.470)	1520
Age 20+ years (2007 - 2008)	.088 (.081-.095)	.090 (.080-.100)	.170 (.150-.190)	.310 (.280-.340)	.450 (.390-.500)	1857
Age 20+ years (2009 - 2010)	.073 (.068-.079)	.080 (.070-.080)	.150 (.130-.160)	.260 (.230-.300)	.370 (.330-.460)	2018
Males (1999 - 2000)	.107 (.096-.120)	.100 (.090-.120)	.210 (.190-.230)	.390 (.310-.470)	.530 (.470-.650)	1160
Males (2001 - 2002)	.088 (.074-.105)	.080 (.060-.100)	.170 (.140-.220)	.330 (.260-.390)	.490 (.380-.580)	1307
Males (2003 - 2004)	.081 (.071-.093)	.080 (.070-.090)	.140 (.130-.170)	.300 (.250-.340)	.430 (.340-.560)	1281
Males (2005 - 2006)	.095 (.090-.101)	.090 (.080-.100)	.180 (.160-.190)	.340 (.310-.380)	.480 (.420-.610)	1271
Males (2007 - 2008)	.109 (.102-.116)	.110 (.100-.130)	.210 (.190-.240)	.380 (.350-.450)	.550 (.450-.660)	1327
Males (2009 - 2010)	.090 (.082-.098)	.090 (.080-.100)	.170 (.150-.190)	.320 (.290-.350)	.500 (.410-.550)	1398
Females (1999 - 2000)	.082 (.077-.087)	.070 (.060-.080)	.150 (.130-.160)	.270 (.240-.300)	.400 (.320-.470)	1178
Females (2001 - 2002)	.076 (.069-.084)	.060 (.060-.080)	.150 (.120-.170)	.280 (.230-.330)	.430 (.340-.560)	1345
Females (2003 - 2004)	.062 (.056-.069)	.060 (.050-.070)	.110 (.100-.120)	.220 (.190-.250)	.370 (.270-.460)	1277
Females (2005 - 2006)	.077 (.069-.085)	.080 (.070-.090)	.160 (.150-.170)	.280 (.250-.320)	.440 (.350-.510)	1305
Females (2007 - 2008)	.090 (.083-.098)	.090 (.080-.100)	.170 (.160-.180)	.300 (.270-.350)	.460 (.420-.550)	1300
Females (2009 - 2010)	.074 (.067-.081)	.070 (.070-.080)	.150 (.130-.170)	.280 (.240-.330)	.400 (.320-.600)	1449

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.04, 0.04, 0.04, 0.021, 0.021, and 0.021 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Tungsten_BiomonitoringSummary.html

Urinary Tungsten (1999 – 2010)

CAS Number 7440-33-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.113 (.095-.133)	.110 (.090-.130)	.200 (.160-.250)	.400 (.300-.520)	.550 (.420-.830)	790
Mexican Americans (2001 - 2002)	.101 (.093-.109)	.100 (.090-.110)	.190 (.170-.210)	.370 (.310-.430)	.570 (.450-.670)	680
Mexican Americans (2003 - 2004)	.086 (.073-.100)	.080 (.070-.100)	.170 (.120-.220)	.360 (.230-.620)	.640 (.410-.800)	618
Mexican Americans (2005 - 2006)	.102 (.088-.118)	.100 (.080-.110)	.200 (.170-.220)	.450 (.310-.650)	.730 (.510-1.04)	652
Mexican Americans (2007 - 2008)	.106 (.084-.135)	.110 (.080-.150)	.210 (.170-.270)	.400 (.250-.670)	.580 (.400-1.12)	515
Mexican Americans (2009 - 2010)	.099 (.089-.109)	.090 (.090-.100)	.200 (.170-.220)	.380 (.340-.470)	.540 (.480-.580)	613
Non-Hispanic blacks (1999 - 2000)	.113 (.101-.126)	.100 (.090-.130)	.210 (.180-.250)	.370 (.290-.460)	.560 (.420-.810)	562
Non-Hispanic blacks (2001 - 2002)	.096 (.080-.116)	.090 (.070-.120)	.160 (.130-.250)	.310 (.270-.400)	.460 (.400-.590)	649
Non-Hispanic blacks (2003 - 2004)	.092 (.082-.104)	.090 (.080-.110)	.160 (.150-.180)	.300 (.250-.330)	.470 (.340-.550)	723
Non-Hispanic blacks (2005 - 2006)	.101 (.088-.116)	.110 (.090-.120)	.190 (.160-.220)	.320 (.280-.370)	.450 (.340-.650)	692
Non-Hispanic blacks (2007 - 2008)	.120 (.099-.146)	.120 (.090-.160)	.240 (.200-.290)	.390 (.340-.440)	.540 (.460-.690)	589
Non-Hispanic blacks (2009 - 2010)	.093 (.086-.100)	.100 (.090-.110)	.180 (.160-.200)	.290 (.270-.340)	.400 (.320-.590)	543
Non-Hispanic whites (1999 - 2000)	.092 (.084-.100)	.080 (.070-.100)	.180 (.160-.200)	.320 (.270-.380)	.470 (.380-.550)	802
Non-Hispanic whites (2001 - 2002)	.076 (.066-.088)	.060 (.050-.080)	.150 (.120-.180)	.290 (.230-.360)	.430 (.330-.620)	1117
Non-Hispanic whites (2003 - 2004)	.065 (.058-.073)	.060 (.060-.070)	.120 (.100-.130)	.230 (.190-.290)	.380 (.320-.410)	1074
Non-Hispanic whites (2005 - 2006)	.082 (.075-.089)	.080 (.080-.090)	.160 (.140-.180)	.300 (.250-.340)	.430 (.380-.480)	1041
Non-Hispanic whites (2007 - 2008)	.093 (.087-.101)	.100 (.090-.110)	.180 (.160-.190)	.330 (.290-.370)	.470 (.410-.570)	1095
Non-Hispanic whites (2009 - 2010)	.077 (.070-.083)	.080 (.070-.090)	.150 (.140-.170)	.280 (.250-.310)	.400 (.330-.540)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.04, 0.04, 0.04, 0.021, 0.021, and 0.021 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Tungsten_BiomonitoringSummary.html

Urinary Tungsten (2011 – 2016)

CAS Number 7440-33-7

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.074 (.067-.082)	.069 (.062-.076)	.143 (.127-.170)	.284 (.235-.361)	.434 (.354-.522)	2491
Total population (2013 - 2014)	.059 (.052-.065)	.058 (.050-.068)	.129 (.113-.146)	.241 (.220-.264)	.380 (.337-.436)	2664
Total population (2015 - 2016)	.068 (.061-.076)	.068 (.060-.078)	.136 (.118-.160)	.263 (.230-.306)	.390 (.321-.463)	3060
Age 3-5 years (2015 - 2016)	.111 (.095-.129)	.117 (.096-.138)	.220 (.173-.259)	.381 (.280-.482)	.582 (.418-.813)	486
Age 6-11 years (2011 - 2012)	.136 (.120-.155)	.138 (.123-.162)	.272 (.229-.301)	.448 (.391-.504)	.583 (.498-.691)	398
Age 6-11 years (2013 - 2014)	.111 (.097-.127)	.114 (.098-.130)	.224 (.184-.245)	.367 (.322-.449)	.606 (.436-.758)	402
Age 6-11 years (2015 - 2016)	.128 (.110-.148)	.137 (.109-.163)	.252 (.199-.328)	.415 (.335-.494)	.561 (.415-.769)	379
Age 12-19 years (2011 - 2012)	.107 (.088-.130)	.112 (.083-.141)	.212 (.175-.269)	.371 (.308-.458)	.506 (.399-.647)	388
Age 12-19 years (2013 - 2014)	.093 (.081-.106)	.094 (.082-.107)	.182 (.161-.207)	.364 (.316-.406)	.559 (.406-.774)	451
Age 12-19 years (2015 - 2016)	.104 (.094-.114)	.111 (.099-.120)	.206 (.166-.244)	.323 (.274-.450)	.500 (.403-.669)	402
Age 20+ years (2011 - 2012)	.066 (.058-.074)	.060 (.055-.067)	.121 (.104-.144)	.237 (.194-.315)	.374 (.274-.493)	1705
Age 20+ years (2013 - 2014)	.051 (.045-.058)	.050 (.042-.059)	.111 (.092-.129)	.213 (.178-.238)	.320 (.264-.380)	1811
Age 20+ years (2015 - 2016)	.059 (.052-.066)	.059 (.052-.068)	.115 (.100-.130)	.225 (.177-.260)	.321 (.260-.436)	1793
Males (2011 - 2012)	.084 (.074-.095)	.080 (.068-.094)	.164 (.136-.200)	.343 (.260-.408)	.471 (.388-.537)	1254
Males (2013 - 2014)	.065 (.057-.074)	.066 (.054-.076)	.141 (.121-.159)	.256 (.230-.295)	.380 (.321-.468)	1318
Males (2015 - 2016)	.078 (.067-.090)	.077 (.067-.091)	.153 (.124-.186)	.284 (.241-.343)	.420 (.332-.548)	1524
Females (2011 - 2012)	.066 (.060-.073)	.060 (.054-.067)	.131 (.115-.145)	.247 (.212-.294)	.361 (.284-.463)	1237
Females (2013 - 2014)	.053 (.048-.059)	.053 (.043-.063)	.119 (.104-.129)	.226 (.197-.244)	.359 (.313-.441)	1346
Females (2015 - 2016)	.060 (.054-.067)	.060 (.053-.068)	.124 (.105-.142)	.237 (.195-.293)	.342 (.301-.450)	1536
Mexican Americans (2011 - 2012)	.097 (.082-.114)	.097 (.071-.115)	.198 (.150-.282)	.434 (.356-.534)	.691 (.473-.827)	314
Mexican Americans (2013 - 2014)	.069 (.057-.083)	.072 (.054-.090)	.150 (.114-.207)	.280 (.216-.395)	.515 (.350-.648)	453
Mexican Americans (2015 - 2016)	.086 (.069-.108)	.082 (.066-.104)	.166 (.128-.211)	.355 (.226-.578)	.572 (.331-.964)	585
Non-Hispanic blacks (2011 - 2012)	.102 (.087-.119)	.096 (.082-.120)	.184 (.145-.245)	.387 (.282-.496)	.537 (.391-.808)	669
Non-Hispanic blacks (2013 - 2014)	.085 (.073-.099)	.085 (.071-.096)	.166 (.151-.194)	.350 (.310-.422)	.493 (.424-.676)	581
Non-Hispanic blacks (2015 - 2016)	.087 (.079-.095)	.087 (.080-.099)	.162 (.149-.177)	.290 (.252-.336)	.441 (.352-.508)	671
Non-Hispanic whites (2011 - 2012)	.068 (.060-.076)	.063 (.056-.070)	.130 (.113-.153)	.260 (.212-.327)	.370 (.307-.463)	810
Non-Hispanic whites (2013 - 2014)	.053 (.046-.062)	.054 (.043-.065)	.117 (.096-.139)	.215 (.172-.255)	.328 (.243-.468)	985
Non-Hispanic whites (2015 - 2016)	.064 (.056-.073)	.065 (.054-.077)	.125 (.108-.154)	.244 (.214-.288)	.337 (.288-.463)	924
All Hispanics (2011 - 2012)	.082 (.072-.092)	.072 (.061-.094)	.162 (.136-.197)	.371 (.294-.433)	.534 (.422-.692)	570
All Hispanics (2013 - 2014)	.064 (.056-.073)	.065 (.054-.076)	.145 (.119-.169)	.264 (.217-.350)	.411 (.346-.585)	701
All Hispanics (2015 - 2016)	.076 (.063-.092)	.073 (.061-.090)	.151 (.125-.188)	.297 (.211-.434)	.464 (.331-.703)	982
Asians (2011 - 2012)	.067 (.058-.077)	.066 (.052-.078)	.135 (.115-.168)	.252 (.206-.319)	.401 (.260-.635)	353
Asians (2013 - 2014)	.052 (.040-.069)	.047 (.030-.067)	.119 (.074-.188)	.290 (.168-.593)	.537 (.290-.700)	292
Asians (2015 - 2016)	.055 (.046-.066)	.052 (.039-.067)	.115 (.085-.167)	.237 (.169-.311)	.361 (.255-.608)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.026, 0.018, and 0.018, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Tungsten_BiomonitoringSummary.html

Urinary Tungsten (creatinine corrected) (1999 – 2010)

CAS Number 7440-33-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.087 (.080-.095)	.080 (.075-.086)	.146 (.136-.158)	.270 (.206-.333)	.383 (.302-.459)	2338
Total population (2001 - 2002)	.078 (.069-.087)	.074 (.064-.084)	.138 (.122-.154)	.255 (.216-.300)	.359 (.315-.436)	2651
Total population (2003 - 2004)	.070 (.063-.078)	.065 (.059-.074)	.117 (.107-.133)	.215 (.179-.253)	.333 (.255-.439)	2558
Total population (2005 - 2006)	.084 (.080-.089)	.080 (.080-.080)	.140 (.130-.150)	.250 (.210-.290)	.350 (.290-.440)	2576
Total population (2007 - 2008)	.103 (.096-.111)	.100 (.090-.110)	.170 (.160-.190)	.320 (.290-.360)	.470 (.410-.540)	2627
Total population (2009 - 2010)	.086 (.080-.093)	.080 (.070-.090)	.150 (.130-.160)	.270 (.230-.310)	.400 (.340-.470)	2847
Age 6-11 years (1999 - 2000)	.174 (.150-.201)	.169 (.136-.198)	.293 (.216-.333)	.439 (.331-.667)	.667 (.452-.880)	320
Age 6-11 years (2001 - 2002)	.168 (.144-.197)	.158 (.139-.190)	.275 (.231-.326)	.412 (.333-.554)	.634 (.436-.1.28)	363
Age 6-11 years (2003 - 2004)	.151 (.131-.174)	.144 (.119-.167)	.250 (.205-.283)	.333 (.278-.484)	.484 (.333-.739)	290
Age 6-11 years (2005 - 2006)	.175 (.152-.202)	.160 (.140-.180)	.270 (.220-.320)	.560 (.330-.790)	.790 (.470-1.18)	355
Age 6-11 years (2007 - 2008)	.209 (.185-.235)	.200 (.180-.240)	.340 (.290-.370)	.540 (.450-.660)	.780 (.620-.910)	394
Age 6-11 years (2009 - 2010)	.205 (.177-.239)	.200 (.160-.230)	.330 (.290-.440)	.620 (.450-.850)	.930 (.690-1.08)	378
Age 12-19 years (1999 - 2000)	.084 (.078-.091)	.079 (.074-.084)	.138 (.124-.158)	.231 (.180-.287)	.339 (.237-.465)	679
Age 12-19 years (2001 - 2002)	.081 (.071-.092)	.081 (.072-.091)	.148 (.122-.167)	.250 (.208-.301)	.359 (.272-.431)	744
Age 12-19 years (2003 - 2004)	.075 (.065-.086)	.071 (.061-.082)	.122 (.098-.148)	.197 (.167-.308)	.379 (.197-.582)	725
Age 12-19 years (2005 - 2006)	.101 (.086-.117)	.100 (.080-.110)	.170 (.140-.200)	.300 (.200-.370)	.370 (.300-.770)	701
Age 12-19 years (2007 - 2008)	.118 (.104-.132)	.120 (.110-.130)	.180 (.160-.210)	.340 (.230-.550)	.530 (.310-.810)	376
Age 12-19 years (2009 - 2010)	.094 (.085-.106)	.090 (.080-.110)	.150 (.120-.180)	.270 (.210-.290)	.370 (.280-.500)	451
Age 20+ years (1999 - 2000)	.080 (.072-.089)	.075 (.067-.082)	.130 (.116-.146)	.218 (.179-.301)	.347 (.245-.426)	1339
Age 20+ years (2001 - 2002)	.070 (.063-.079)	.067 (.058-.075)	.119 (.099-.139)	.216 (.176-.267)	.333 (.253-.431)	1544
Age 20+ years (2003 - 2004)	.063 (.057-.071)	.059 (.053-.065)	.105 (.094-.117)	.181 (.155-.215)	.279 (.217-.370)	1543
Age 20+ years (2005 - 2006)	.075 (.071-.079)	.070 (.070-.080)	.120 (.110-.130)	.210 (.200-.220)	.290 (.240-.360)	1520
Age 20+ years (2007 - 2008)	.093 (.087-.101)	.090 (.080-.100)	.160 (.140-.170)	.280 (.250-.310)	.420 (.350-.490)	1857
Age 20+ years (2009 - 2010)	.078 (.072-.084)	.070 (.070-.080)	.130 (.120-.140)	.220 (.190-.260)	.340 (.270-.400)	2018
Males (1999 - 2000)	.083 (.074-.094)	.073 (.063-.086)	.146 (.126-.165)	.279 (.198-.386)	.439 (.329-.605)	1160
Males (2001 - 2002)	.071 (.060-.083)	.065 (.056-.077)	.125 (.098-.153)	.255 (.203-.306)	.364 (.300-.431)	1306
Males (2003 - 2004)	.068 (.059-.079)	.062 (.054-.071)	.111 (.098-.133)	.216 (.170-.284)	.341 (.240-.500)	1281
Males (2005 - 2006)	.078 (.073-.083)	.070 (.070-.080)	.130 (.120-.150)	.240 (.200-.300)	.360 (.300-.440)	1271
Males (2007 - 2008)	.097 (.090-.106)	.090 (.090-.110)	.170 (.150-.180)	.310 (.280-.360)	.440 (.410-.480)	1327
Males (2009 - 2010)	.082 (.074-.089)	.070 (.070-.080)	.140 (.120-.150)	.250 (.220-.310)	.440 (.320-.500)	1398
Females (1999 - 2000)	.091 (.085-.098)	.084 (.080-.091)	.145 (.136-.158)	.265 (.200-.301)	.339 (.300-.381)	1178
Females (2001 - 2002)	.085 (.077-.094)	.083 (.075-.091)	.143 (.130-.161)	.258 (.216-.317)	.353 (.317-.538)	1345
Females (2003 - 2004)	.072 (.065-.079)	.069 (.063-.078)	.121 (.108-.138)	.211 (.176-.237)	.333 (.261-.439)	1277
Females (2005 - 2006)	.090 (.085-.096)	.080 (.080-.090)	.150 (.140-.160)	.250 (.210-.290)	.350 (.260-.530)	1305
Females (2007 - 2008)	.109 (.100-.118)	.100 (.090-.120)	.180 (.160-.210)	.330 (.290-.360)	.520 (.400-.590)	1300
Females (2009 - 2010)	.091 (.083-.100)	.090 (.080-.090)	.150 (.130-.170)	.270 (.210-.340)	.380 (.330-.450)	1449

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Tungsten_BiomonitoringSummary.html

Urinary Tungsten (creatinine corrected) (1999 – 2010)

CAS Number 7440-33-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.106 (.093-.120)	.100 (.086-.116)	.184 (.152-.214)	.329 (.267-.392)	.497 (.354-.727)	790
Mexican Americans (2001 - 2002)	.098 (.090-.108)	.089 (.081-.100)	.164 (.143-.187)	.294 (.258-.375)	.555 (.410-.797)	679
Mexican Americans (2003 - 2004)	.079 (.065-.096)	.073 (.054-.093)	.136 (.103-.197)	.300 (.233-.426)	.482 (.344-.823)	618
Mexican Americans (2005 - 2006)	.096 (.083-.111)	.090 (.080-.090)	.160 (.150-.180)	.330 (.250-.420)	.670 (.360-.890)	652
Mexican Americans (2007 - 2008)	.106 (.083-.137)	.110 (.080-.140)	.200 (.160-.270)	.400 (.260-.710)	.610 (.310-1.12)	515
Mexican Americans (2009 - 2010)	.103 (.096-.111)	.100 (.090-.110)	.180 (.160-.200)	.330 (.290-.390)	.480 (.390-.540)	613
Non-Hispanic blacks (1999 - 2000)	.073 (.064-.083)	.071 (.061-.081)	.124 (.109-.154)	.201 (.188-.222)	.360 (.217-.465)	562
Non-Hispanic blacks (2001 - 2002)	.066 (.056-.077)	.060 (.049-.079)	.109 (.090-.125)	.199 (.153-.285)	.340 (.250-.414)	649
Non-Hispanic blacks (2003 - 2004)	.066 (.059-.074)	.067 (.055-.075)	.105 (.095-.120)	.186 (.150-.224)	.317 (.214-.358)	723
Non-Hispanic blacks (2005 - 2006)	.073 (.065-.082)	.070 (.060-.080)	.120 (.110-.140)	.210 (.190-.260)	.320 (.260-.390)	692
Non-Hispanic blacks (2007 - 2008)	.088 (.076-.102)	.090 (.070-.100)	.150 (.140-.160)	.240 (.220-.300)	.380 (.270-.630)	589
Non-Hispanic blacks (2009 - 2010)	.074 (.067-.080)	.070 (.060-.080)	.120 (.110-.140)	.210 (.180-.250)	.310 (.220-.410)	543
Non-Hispanic whites (1999 - 2000)	.091 (.083-.100)	.082 (.077-.088)	.150 (.136-.169)	.279 (.200-.354)	.385 (.302-.462)	802
Non-Hispanic whites (2001 - 2002)	.078 (.068-.088)	.073 (.061-.085)	.139 (.121-.157)	.253 (.209-.308)	.353 (.286-.453)	1117
Non-Hispanic whites (2003 - 2004)	.069 (.060-.078)	.063 (.057-.071)	.116 (.104-.133)	.199 (.167-.237)	.299 (.222-.439)	1074
Non-Hispanic whites (2005 - 2006)	.085 (.080-.090)	.080 (.080-.090)	.140 (.130-.160)	.240 (.210-.280)	.340 (.280-.420)	1041
Non-Hispanic whites (2007 - 2008)	.104 (.096-.114)	.100 (.090-.110)	.180 (.160-.200)	.310 (.280-.360)	.460 (.390-.530)	1095
Non-Hispanic whites (2009 - 2010)	.086 (.078-.094)	.080 (.070-.090)	.140 (.130-.160)	.250 (.200-.310)	.370 (.330-.400)	1225

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Tungsten_BiomonitoringSummary.html

Urinary Tungsten (creatinine corrected) (2011 – 2016)

CAS Number 7440-33-7

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.084 (.076-.093)	.077 (.072-.085)	.140 (.123-.161)	.260 (.209-.323)	.402 (.294-.536)	2489
Total population (2013 - 2014)	.068 (.061-.075)	.065 (.058-.072)	.124 (.111-.136)	.224 (.195-.251)	.332 (.303-.377)	2663
Total population (2015 - 2016)	.076 (.068-.085)	.072 (.063-.080)	.129 (.115-.145)	.241 (.205-.289)	.363 (.289-.482)	3057
Age 3-5 years (2015 - 2016)	.255 (.217-.300)	.236 (.205-.279)	.390 (.308-.513)	.637 (.513-.920)	.958 (.626-1.95)	485
Age 6-11 years (2011 - 2012)	.194 (.174-.217)	.183 (.159-.214)	.312 (.256-.407)	.500 (.421-.652)	.687 (.515-.863)	397
Age 6-11 years (2013 - 2014)	.166 (.152-.181)	.166 (.149-.176)	.249 (.229-.295)	.400 (.327-.518)	.673 (.457-.764)	402
Age 6-11 years (2015 - 2016)	.181 (.165-.199)	.183 (.160-.197)	.280 (.242-.339)	.444 (.367-.531)	.556 (.444-.901)	379
Age 12-19 years (2011 - 2012)	.103 (.091-.116)	.099 (.086-.111)	.164 (.144-.181)	.288 (.203-.324)	.381 (.286-.656)	388
Age 12-19 years (2013 - 2014)	.084 (.073-.097)	.089 (.071-.101)	.144 (.127-.162)	.246 (.195-.293)	.327 (.293-.492)	451
Age 12-19 years (2015 - 2016)	.097 (.087-.108)	.096 (.086-.103)	.146 (.130-.170)	.248 (.190-.375)	.375 (.253-.582)	402
Age 20+ years (2011 - 2012)	.074 (.067-.083)	.069 (.064-.075)	.121 (.104-.138)	.215 (.170-.263)	.334 (.233-.458)	1704
Age 20+ years (2013 - 2014)	.060 (.054-.066)	.057 (.051-.062)	.105 (.092-.117)	.186 (.163-.212)	.286 (.227-.357)	1810
Age 20+ years (2015 - 2016)	.064 (.057-.071)	.061 (.054-.066)	.103 (.091-.118)	.177 (.149-.206)	.279 (.202-.340)	1791
Males (2011 - 2012)	.079 (.068-.090)	.075 (.064-.085)	.131 (.112-.150)	.261 (.180-.327)	.400 (.276-.539)	1253
Males (2013 - 2014)	.065 (.057-.073)	.065 (.054-.075)	.121 (.103-.135)	.199 (.179-.248)	.316 (.278-.377)	1317
Males (2015 - 2016)	.074 (.063-.086)	.068 (.058-.082)	.126 (.105-.151)	.243 (.188-.340)	.408 (.272-.560)	1524
Females (2011 - 2012)	.090 (.083-.097)	.079 (.075-.088)	.150 (.134-.165)	.257 (.223-.324)	.404 (.314-.544)	1236
Females (2013 - 2014)	.071 (.065-.077)	.065 (.059-.072)	.127 (.116-.137)	.240 (.220-.261)	.342 (.311-.383)	1346
Females (2015 - 2016)	.079 (.073-.085)	.074 (.068-.080)	.130 (.120-.143)	.241 (.206-.279)	.326 (.293-.377)	1533
Mexican Americans (2011 - 2012)	.110 (.090-.134)	.102 (.071-.142)	.192 (.150-.270)	.381 (.263-.633)	.633 (.396-.729)	314
Mexican Americans (2013 - 2014)	.079 (.067-.093)	.073 (.059-.093)	.146 (.115-.172)	.287 (.211-.369)	.471 (.338-.602)	453
Mexican Americans (2015 - 2016)	.095 (.074-.121)	.083 (.062-.113)	.179 (.128-.259)	.332 (.259-.478)	.482 (.319-.856)	584
Non-Hispanic blacks (2011 - 2012)	.079 (.068-.092)	.072 (.060-.083)	.129 (.102-.151)	.246 (.168-.411)	.440 (.253-.669)	669
Non-Hispanic blacks (2013 - 2014)	.064 (.056-.074)	.059 (.050-.071)	.118 (.105-.127)	.233 (.193-.275)	.342 (.296-.430)	581
Non-Hispanic blacks (2015 - 2016)	.069 (.063-.076)	.064 (.059-.073)	.117 (.099-.133)	.203 (.181-.221)	.296 (.225-.390)	669
Non-Hispanic whites (2011 - 2012)	.082 (.072-.094)	.076 (.068-.088)	.135 (.113-.164)	.247 (.183-.324)	.353 (.250-.515)	808
Non-Hispanic whites (2013 - 2014)	.066 (.058-.075)	.064 (.056-.072)	.118 (.100-.141)	.200 (.167-.257)	.307 (.227-.395)	984
Non-Hispanic whites (2015 - 2016)	.076 (.066-.086)	.072 (.061-.083)	.126 (.109-.147)	.227 (.187-.280)	.331 (.256-.497)	924
All Hispanics (2011 - 2012)	.092 (.078-.108)	.079 (.068-.100)	.164 (.134-.184)	.312 (.263-.404)	.473 (.367-.664)	570
All Hispanics (2013 - 2014)	.072 (.064-.080)	.068 (.058-.079)	.133 (.115-.148)	.240 (.200-.320)	.391 (.319-.549)	701
All Hispanics (2015 - 2016)	.086 (.070-.106)	.078 (.062-.099)	.153 (.122-.210)	.313 (.238-.413)	.464 (.321-.715)	981
Asians (2011 - 2012)	.089 (.075-.107)	.082 (.073-.103)	.152 (.129-.181)	.296 (.207-.413)	.449 (.299-.824)	353
Asians (2013 - 2014)	.082 (.064-.104)	.079 (.059-.101)	.157 (.119-.227)	.330 (.227-.480)	.503 (.316-.818)	292
Asians (2015 - 2016)	.075 (.064-.089)	.074 (.056-.088)	.127 (.109-.150)	.238 (.173-.412)	.429 (.263-.599)	332

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Tungsten_BiomonitoringSummary.html

Urinary Uranium (1999 – 2010)

CAS Number 7440-61-1

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.008 (.007-.009)	.007 (.006-.008)	.013 (.010-.017)	.027 (.021-.038)	.046 (.037-.056)	2464
Total population (2001 - 2002)	.009 (.007-.010)	.008 (.007-.009)	.014 (.012-.018)	.030 (.023-.039)	.046 (.034-.062)	2690
Total population (2003 - 2004)	.008 (.007-.008)	.007 (.006-.007)	.011 (.010-.013)	.021 (.017-.026)	.031 (.026-.037)	2557
Total population (2005 - 2006)	.006 (.005-.006)	.005 (.005-.006)	.010 (.009-.012)	.019 (.016-.022)	.033 (.023-.041)	2576
Total population (2007 - 2008)	.007 (.006-.008)	.007 (.005-.008)	.013 (.011-.015)	.024 (.018-.033)	.039 (.026-.057)	2627
Total population (2009 - 2010)	.007 (.006-.008)	.007 (.006-.008)	.013 (.011-.015)	.022 (.019-.030)	.036 (.029-.044)	2848
Age 6-11 years (1999 - 2000)	.009 (.007-.011)	.007 (.006-.009)	.013 (.009-.022)	.032 (.019-.048)	.048 (.033-.066)	340
Age 6-11 years (2001 - 2002)	.008 (.007-.010)	.008 (.006-.010)	.014 (.010-.020)	.026 (.020-.036)	.040 (.025-.049)	368
Age 6-11 years (2003 - 2004)	.008 (.007-.009)	.007 (.006-.009)	.012 (.009-.016)	.020 (.016-.026)	.028 (.020-.039)	289
Age 6-11 years (2005 - 2006)	.006 (.005-.007)	.005 (.004-.007)	.010 (.008-.011)	.015 (.012-.031)	.031 (.013-.051)	355
Age 6-11 years (2007 - 2008)	.007 (.006-.008)	.006 (.005-.008)	.012 (.009-.016)	.021 (.016-.027)	.030 (.022-.039)	394
Age 6-11 years (2009 - 2010)	.006 (.005-.008)	.006 (.005-.008)	.012 (.009-.014)	.018 (.013-.034)	.033 (.016-.052)	378
Age 12-19 years (1999 - 2000)	.009 (.008-.011)	.009 (.008-.010)	.015 (.012-.018)	.026 (.020-.043)	.044 (.028-.072)	719
Age 12-19 years (2001 - 2002)	.010 (.008-.012)	.010 (.008-.012)	.017 (.013-.023)	.030 (.022-.042)	.042 (.027-.088)	762
Age 12-19 years (2003 - 2004)	.010 (.009-.011)	.009 (.008-.010)	.015 (.012-.018)	.028 (.023-.036)	.038 (.036-.053)	725
Age 12-19 years (2005 - 2006)	.007 (.006-.008)	.007 (.006-.008)	.013 (.011-.015)	.023 (.018-.032)	.034 (.027-.045)	701
Age 12-19 years (2007 - 2008)	.009 (.007-.011)	.008 (.007-.011)	.016 (.014-.020)	.029 (.022-.056)	.056 (.027-.156)	376
Age 12-19 years (2009 - 2010)	.008 (.007-.010)	.008 (.006-.010)	.014 (.011-.018)	.023 (.020-.038)	.040 (.024-.059)	451
Age 20+ years (1999 - 2000)	.008 (.006-.009)	.007 (.005-.008)	.013 (.010-.017)	.027 (.021-.040)	.046 (.036-.056)	1405
Age 20+ years (2001 - 2002)	.009 (.007-.010)	.008 (.007-.009)	.014 (.012-.017)	.031 (.022-.040)	.046 (.034-.065)	1560
Age 20+ years (2003 - 2004)	*	.006 (.005-.007)	.011 (.009-.012)	.019 (.016-.026)	.029 (.024-.038)	1543
Age 20+ years (2005 - 2006)	.006 (.005-.006)	.005 (.005-.006)	.010 (.008-.012)	.019 (.015-.022)	.032 (.022-.041)	1520
Age 20+ years (2007 - 2008)	.007 (.005-.008)	.006 (.005-.008)	.013 (.010-.015)	.024 (.017-.035)	.039 (.026-.052)	1857
Age 20+ years (2009 - 2010)	.007 (.006-.008)	.007 (.006-.008)	.013 (.011-.015)	.023 (.019-.030)	.036 (.029-.044)	2019
Males (1999 - 2000)	.009 (.008-.011)	.008 (.007-.010)	.015 (.012-.021)	.036 (.024-.046)	.053 (.040-.067)	1227
Males (2001 - 2002)	.009 (.008-.011)	.009 (.007-.010)	.015 (.013-.021)	.033 (.024-.045)	.047 (.035-.065)	1335
Males (2003 - 2004)	.008 (.007-.009)	.007 (.006-.008)	.013 (.011-.016)	.023 (.019-.027)	.031 (.027-.035)	1280
Males (2005 - 2006)	.006 (.006-.007)	.006 (.005-.006)	.011 (.009-.012)	.019 (.015-.022)	.030 (.021-.043)	1271
Males (2007 - 2008)	.007 (.006-.009)	.007 (.006-.009)	.014 (.013-.016)	.026 (.021-.037)	.046 (.030-.056)	1327
Males (2009 - 2010)	.007 (.006-.009)	.007 (.006-.009)	.014 (.012-.017)	.024 (.020-.034)	.040 (.032-.046)	1398
Females (1999 - 2000)	.007 (.006-.008)	.006 (.005-.007)	.012 (.009-.015)	.023 (.016-.033)	.036 (.026-.050)	1237
Females (2001 - 2002)	.008 (.007-.010)	.008 (.006-.009)	.014 (.011-.017)	.027 (.019-.037)	.041 (.029-.063)	1355
Females (2003 - 2004)	*	.006 (.005-.007)	.010 (.009-.011)	.018 (.013-.027)	.031 (.022-.039)	1277
Females (2005 - 2006)	.005 (.005-.006)	.005 (.004-.006)	.010 (.008-.011)	.019 (.016-.023)	.034 (.025-.040)	1305
Females (2007 - 2008)	.006 (.005-.008)	.006 (.005-.007)	.011 (.009-.015)	.024 (.016-.033)	.035 (.022-.067)	1300
Females (2009 - 2010)	.007 (.006-.008)	.007 (.006-.008)	.012 (.011-.014)	.022 (.017-.029)	.033 (.023-.045)	1450

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.004, 0.004, 0.005, 0.002, 0.002, and 0.002 respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Uranium_BiomonitoringSummary.html

Urinary Uranium (1999 – 2010)

CAS Number 7440-61-1

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.017 (.012-.023)	.016 (.011-.021)	.033 (.020-.054)	.060 (.040-.127)	.114 (.054-.279)	883
Mexican Americans (2001 - 2002)	.013 (.010-.016)	.012 (.009-.016)	.022 (.017-.030)	.040 (.031-.054)	.055 (.046-.069)	683
Mexican Americans (2003 - 2004)	.014 (.011-.017)	.013 (.009-.018)	.024 (.017-.034)	.041 (.028-.073)	.064 (.039-.158)	618
Mexican Americans (2005 - 2006)	.008 (.007-.009)	.009 (.007-.010)	.014 (.013-.017)	.025 (.021-.033)	.042 (.028-.051)	652
Mexican Americans (2007 - 2008)	.009 (.008-.011)	.009 (.008-.010)	.017 (.014-.022)	.032 (.026-.039)	.047 (.032-.073)	515
Mexican Americans (2009 - 2010)	.009 (.008-.011)	.009 (.008-.011)	.018 (.015-.021)	.034 (.027-.040)	.046 (.039-.055)	613
Non-Hispanic blacks (1999 - 2000)	.009 (.007-.011)	.008 (.006-.010)	.014 (.010-.020)	.028 (.018-.049)	.052 (.030-.067)	568
Non-Hispanic blacks (2001 - 2002)	.008 (.007-.009)	.008 (.007-.009)	.012 (.011-.015)	.021 (.017-.027)	.030 (.023-.037)	667
Non-Hispanic blacks (2003 - 2004)	.008 (.008-.009)	.007 (.007-.008)	.012 (.011-.013)	.021 (.017-.027)	.031 (.023-.045)	722
Non-Hispanic blacks (2005 - 2006)	.006 (.005-.007)	.006 (.005-.007)	.010 (.009-.011)	.016 (.014-.020)	.023 (.018-.031)	692
Non-Hispanic blacks (2007 - 2008)	.007 (.006-.009)	.007 (.006-.008)	.013 (.010-.016)	.024 (.016-.038)	.038 (.025-.055)	589
Non-Hispanic blacks (2009 - 2010)	.008 (.007-.010)	.008 (.007-.010)	.014 (.012-.016)	.027 (.017-.044)	.044 (.027-.074)	544
Non-Hispanic whites (1999 - 2000)	.007 (.006-.009)	.007 (.006-.007)	.012 (.009-.016)	.023 (.017-.037)	.043 (.027-.051)	822
Non-Hispanic whites (2001 - 2002)	.008 (.007-.009)	.007 (.006-.009)	.013 (.011-.016)	.026 (.019-.035)	.037 (.029-.050)	1132
Non-Hispanic whites (2003 - 2004)	*	.006 (.005-.007)	.010 (.009-.012)	.018 (.015-.023)	.027 (.020-.036)	1074
Non-Hispanic whites (2005 - 2006)	.005 (.005-.006)	.005 (.004-.006)	.010 (.008-.012)	.018 (.014-.022)	.033 (.021-.043)	1041
Non-Hispanic whites (2007 - 2008)	.006 (.005-.008)	.006 (.005-.008)	.013 (.009-.016)	.023 (.015-.039)	.038 (.022-.086)	1095
Non-Hispanic whites (2009 - 2010)	.006 (.005-.007)	.006 (.005-.007)	.012 (.011-.014)	.021 (.017-.027)	.032 (.023-.041)	1225

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.004, 0.004, 0.005, 0.002, 0.002, and 0.002 respectively.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Uranium_BiomonitoringSummary.html

Urinary Uranium (2011 – 2016)

CAS Number 7440-61-1

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.006 (.005-.007)	.006 (.005-.007)	.011 (.008-.014)	.019 (.015-.025)	.031 (.023-.043)	2504
Total population (2013 - 2014)	.005 (.004-.006)	.005 (.004-.005)	.010 (.008-.013)	.023 (.015-.038)	.039 (.023-.066)	2664
Total population (2015 - 2016)	.005 (.004-.006)	.005 (.004-.005)	.010 (.008-.012)	.018 (.015-.025)	.031 (.023-.036)	3061
Age 3-5 years (2015 - 2016)	.004 (.003-.005)	.004 (.003-.005)	.007 (.005-.009)	.015 (.010-.019)	.019 (.014-.027)	486
Age 6-11 years (2011 - 2012)	.006 (.005-.007)	.006 (.005-.008)	.011 (.009-.013)	.019 (.013-.024)	.025 (.020-.037)	399
Age 6-11 years (2013 - 2014)	.005 (.004-.007)	.005 (.004-.006)	.010 (.007-.017)	.023 (.015-.034)	.034 (.019-.061)	402
Age 6-11 years (2015 - 2016)	.004 (.004-.005)	.004 (.004-.005)	.007 (.005-.010)	.014 (.011-.018)	.022 (.015-.033)	379
Age 12-19 years (2011 - 2012)	.007 (.006-.009)	.007 (.005-.008)	.012 (.009-.017)	.021 (.014-.032)	.033 (.021-.052)	390
Age 12-19 years (2013 - 2014)	.006 (.005-.007)	.005 (.004-.006)	.010 (.007-.016)	.023 (.013-.047)	.046 (.020-.096)	451
Age 12-19 years (2015 - 2016)	.006 (.005-.007)	.005 (.004-.008)	.011 (.008-.014)	.018 (.014-.026)	.028 (.019-.053)	402
Age 20+ years (2011 - 2012)	.006 (.005-.007)	.005 (.004-.007)	.011 (.008-.013)	.019 (.015-.025)	.031 (.023-.043)	1715
Age 20+ years (2013 - 2014)	.005 (.004-.006)	.005 (.004-.005)	.010 (.008-.012)	.023 (.015-.035)	.038 (.023-.066)	1811
Age 20+ years (2015 - 2016)	.005 (.004-.006)	.005 (.004-.005)	.010 (.008-.013)	.019 (.015-.027)	.031 (.023-.038)	1794
Males (2011 - 2012)	.007 (.005-.008)	.006 (.005-.007)	.011 (.009-.014)	.020 (.014-.032)	.034 (.022-.045)	1262
Males (2013 - 2014)	.005 (.004-.006)	.005 (.004-.005)	.010 (.008-.014)	.024 (.014-.041)	.040 (.023-.077)	1318
Males (2015 - 2016)	.005 (.005-.006)	.005 (.004-.006)	.011 (.008-.013)	.018 (.014-.026)	.029 (.021-.035)	1524
Females (2011 - 2012)	.006 (.005-.007)	.005 (.004-.006)	.010 (.008-.013)	.019 (.015-.025)	.029 (.024-.042)	1242
Females (2013 - 2014)	.005 (.004-.006)	.005 (.004-.005)	.010 (.008-.012)	.022 (.015-.033)	.036 (.022-.065)	1346
Females (2015 - 2016)	.005 (.004-.006)	.004 (.004-.005)	.009 (.007-.011)	.019 (.015-.025)	.031 (.023-.036)	1537
Mexican Americans (2011 - 2012)	.007 (.006-.009)	.007 (.006-.009)	.013 (.010-.016)	.023 (.015-.033)	.031 (.017-.054)	317
Mexican Americans (2013 - 2014)	.008 (.006-.009)	.008 (.006-.011)	.015 (.012-.020)	.028 (.022-.040)	.043 (.028-.058)	453
Mexican Americans (2015 - 2016)	.006 (.005-.008)	.006 (.005-.007)	.011 (.008-.016)	.021 (.016-.030)	.032 (.022-.042)	585
Non-Hispanic blacks (2011 - 2012)	.006 (.005-.008)	.006 (.005-.008)	.011 (.008-.014)	.019 (.014-.028)	.029 (.022-.042)	669
Non-Hispanic blacks (2013 - 2014)	.005 (.005-.006)	.005 (.005-.006)	.009 (.008-.011)	.017 (.013-.023)	.025 (.016-.046)	581
Non-Hispanic blacks (2015 - 2016)	.006 (.005-.007)	.005 (.005-.006)	.011 (.008-.014)	.020 (.015-.027)	.029 (.020-.051)	671
Non-Hispanic whites (2011 - 2012)	.006 (.005-.007)	.006 (.004-.007)	.011 (.008-.014)	.021 (.015-.029)	.034 (.023-.045)	820
Non-Hispanic whites (2013 - 2014)	.005 (.004-.006)	.004 (.003-.005)	.009 (.006-.016)	.023 (.011-.046)	.040 (.019-.098)	985
Non-Hispanic whites (2015 - 2016)	.005 (.004-.006)	.005 (.004-.006)	.010 (.007-.013)	.019 (.014-.029)	.031 (.019-.041)	924
All Hispanics (2011 - 2012)	.006 (.005-.007)	.005 (.005-.007)	.011 (.008-.014)	.018 (.013-.030)	.030 (.018-.047)	573
All Hispanics (2013 - 2014)	.007 (.006-.008)	.007 (.005-.008)	.013 (.011-.018)	.026 (.019-.034)	.040 (.026-.057)	701
All Hispanics (2015 - 2016)	.005 (.004-.006)	.005 (.004-.006)	.009 (.007-.013)	.018 (.012-.029)	.029 (.018-.042)	982
Asians (2011 - 2012)	.005 (.005-.006)	.005 (.004-.005)	.009 (.007-.013)	.016 (.014-.020)	.021 (.016-.040)	353
Asians (2013 - 2014)	.005 (.004-.008)	.005 (.003-.007)	.011 (.006-.025)	.031 (.011-.068)	.051 (.025-.101)	292
Asians (2015 - 2016)	.004 (.003-.005)	.004 (.003-.004)	.007 (.006-.010)	.015 (.010-.020)	.022 (.016-.032)	332

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.003, 0.002, and 0.002, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Uranium_BiomonitoringSummary.html

Urinary Uranium (creatinine corrected) (1999 – 2010)

CAS Number 7440-61-1

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.007 (.006-.009)	.007 (.006-.009)	.013 (.010-.016)	.024 (.019-.030)	.034 (.027-.053)	2464
Total population (2001 - 2002)	.008 (.007-.010)	.007 (.006-.009)	.014 (.011-.018)	.026 (.020-.034)	.040 (.028-.058)	2689
Total population (2003 - 2004)	.008 (.007-.008)	.007 (.006-.008)	.012 (.010-.014)	.021 (.017-.025)	.029 (.023-.039)	2557
Total population (2005 - 2006)	.006 (.005-.006)	.005 (.005-.006)	.009 (.008-.010)	.017 (.014-.020)	.026 (.020-.039)	2576
Total population (2007 - 2008)	.007 (.006-.009)	.006 (.005-.008)	.012 (.009-.016)	.024 (.016-.038)	.038 (.025-.065)	2627
Total population (2009 - 2010)	.007 (.006-.008)	.007 (.006-.008)	.012 (.010-.013)	.020 (.017-.024)	.029 (.024-.035)	2848
Age 6-11 years (1999 - 2000)	.009 (.007-.012)	.008 (.006-.011)	.015 (.010-.024)	.030 (.016-.044)	.037 (.030-.077)	340
Age 6-11 years (2001 - 2002)	.010 (.008-.011)	.010 (.008-.012)	.015 (.013-.019)	.027 (.018-.032)	.033 (.027-.048)	368
Age 6-11 years (2003 - 2004)	.009 (.008-.010)	.008 (.007-.010)	.013 (.011-.017)	.024 (.016-.039)	.033 (.022-.050)	289
Age 6-11 years (2005 - 2006)	.007 (.006-.008)	.006 (.005-.008)	.010 (.008-.014)	.018 (.013-.035)	.034 (.018-.048)	355
Age 6-11 years (2007 - 2008)	.009 (.007-.011)	.008 (.007-.010)	.014 (.010-.022)	.026 (.016-.053)	.042 (.023-.065)	394
Age 6-11 years (2009 - 2010)	.009 (.007-.010)	.008 (.007-.010)	.014 (.011-.016)	.020 (.015-.030)	.029 (.022-.033)	378
Age 12-19 years (1999 - 2000)	.007 (.006-.008)	.006 (.005-.008)	.010 (.009-.014)	.020 (.014-.030)	.030 (.019-.074)	719
Age 12-19 years (2001 - 2002)	.007 (.006-.008)	.007 (.006-.008)	.012 (.009-.016)	.020 (.015-.026)	.026 (.020-.042)	762
Age 12-19 years (2003 - 2004)	.007 (.006-.008)	.006 (.005-.007)	.010 (.008-.013)	.019 (.015-.027)	.034 (.022-.041)	725
Age 12-19 years (2005 - 2006)	.006 (.005-.007)	.005 (.005-.006)	.009 (.007-.012)	.017 (.013-.022)	.023 (.019-.026)	701
Age 12-19 years (2007 - 2008)	.007 (.006-.009)	.006 (.005-.008)	.012 (.009-.016)	.025 (.013-.050)	.033 (.022-.077)	376
Age 12-19 years (2009 - 2010)	.007 (.006-.009)	.007 (.006-.008)	.011 (.010-.013)	.017 (.014-.021)	.025 (.017-.038)	451
Age 20+ years (1999 - 2000)	.007 (.006-.009)	.007 (.006-.009)	.013 (.010-.016)	.024 (.019-.029)	.034 (.025-.051)	1405
Age 20+ years (2001 - 2002)	.008 (.007-.010)	.007 (.006-.009)	.014 (.011-.019)	.027 (.020-.039)	.043 (.030-.063)	1559
Age 20+ years (2003 - 2004)	*	.007 (.006-.008)	.012 (.010-.014)	.020 (.017-.024)	.028 (.022-.038)	1543
Age 20+ years (2005 - 2006)	.006 (.005-.006)	.005 (.005-.006)	.009 (.008-.010)	.016 (.014-.019)	.026 (.020-.039)	1520
Age 20+ years (2007 - 2008)	.007 (.006-.008)	.006 (.005-.008)	.012 (.009-.016)	.024 (.016-.036)	.037 (.025-.065)	1857
Age 20+ years (2009 - 2010)	.007 (.006-.008)	.007 (.006-.008)	.012 (.010-.013)	.020 (.017-.025)	.029 (.024-.036)	2019
Males (1999 - 2000)	.007 (.006-.009)	.006 (.005-.008)	.011 (.009-.015)	.021 (.017-.028)	.035 (.024-.056)	1227
Males (2001 - 2002)	.007 (.006-.008)	.007 (.006-.008)	.012 (.010-.015)	.022 (.018-.028)	.033 (.025-.047)	1334
Males (2003 - 2004)	.007 (.006-.008)	.006 (.006-.007)	.010 (.009-.012)	.019 (.015-.024)	.026 (.019-.039)	1280
Males (2005 - 2006)	.005 (.005-.005)	.005 (.004-.005)	.008 (.007-.009)	.014 (.013-.016)	.021 (.016-.031)	1271
Males (2007 - 2008)	.007 (.005-.008)	.006 (.005-.007)	.012 (.009-.015)	.022 (.016-.031)	.032 (.024-.056)	1327
Males (2009 - 2010)	.007 (.006-.008)	.006 (.006-.007)	.011 (.010-.012)	.019 (.015-.023)	.028 (.022-.033)	1398
Females (1999 - 2000)	.008 (.007-.010)	.007 (.006-.010)	.013 (.010-.017)	.025 (.019-.033)	.034 (.027-.054)	1237
Females (2001 - 2002)	.009 (.008-.011)	.009 (.007-.011)	.016 (.012-.021)	.029 (.021-.042)	.045 (.031-.067)	1355
Females (2003 - 2004)	*	.008 (.007-.009)	.013 (.011-.016)	.022 (.018-.028)	.031 (.025-.041)	1277
Females (2005 - 2006)	.006 (.006-.007)	.006 (.005-.006)	.010 (.009-.011)	.019 (.015-.024)	.035 (.022-.041)	1305
Females (2007 - 2008)	.008 (.006-.009)	.007 (.006-.008)	.013 (.010-.018)	.026 (.016-.043)	.042 (.024-.083)	1300
Females (2009 - 2010)	.008 (.007-.009)	.008 (.006-.009)	.013 (.011-.015)	.021 (.017-.027)	.031 (.024-.041)	1450

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Uranium_BiomonitoringSummary.html

Urinary Uranium (creatinine corrected) (1999 – 2010)

CAS Number 7440-61-1

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.015 (.011-.022)	.015 (.011-.020)	.029 (.016-.058)	.059 (.027-.146)	.100 (.042-.270)	883
Mexican Americans (2001 - 2002)	.012 (.010-.016)	.012 (.009-.016)	.021 (.015-.028)	.033 (.024-.053)	.050 (.034-.080)	682
Mexican Americans (2003 - 2004)	.013 (.010-.016)	.013 (.009-.017)	.022 (.016-.029)	.035 (.026-.051)	.051 (.034-.061)	618
Mexican Americans (2005 - 2006)	.008 (.007-.009)	.007 (.006-.008)	.013 (.010-.015)	.022 (.016-.031)	.035 (.025-.060)	652
Mexican Americans (2007 - 2008)	.009 (.008-.012)	.009 (.007-.011)	.017 (.014-.021)	.031 (.021-.048)	.042 (.027-.097)	515
Mexican Americans (2009 - 2010)	.010 (.009-.011)	.010 (.008-.011)	.016 (.013-.018)	.026 (.022-.030)	.036 (.030-.044)	613
Non-Hispanic blacks (1999 - 2000)	.006 (.004-.007)	.005 (.004-.006)	.008 (.006-.013)	.017 (.011-.029)	.028 (.018-.048)	568
Non-Hispanic blacks (2001 - 2002)	.005 (.005-.006)	.005 (.005-.006)	.008 (.007-.010)	.013 (.011-.014)	.017 (.014-.029)	667
Non-Hispanic blacks (2003 - 2004)	.006 (.005-.006)	.005 (.005-.006)	.009 (.008-.009)	.013 (.012-.015)	.018 (.014-.024)	722
Non-Hispanic blacks (2005 - 2006)	.004 (.004-.005)	.004 (.003-.005)	.006 (.006-.007)	.011 (.009-.015)	.017 (.012-.021)	692
Non-Hispanic blacks (2007 - 2008)	.005 (.005-.006)	.005 (.004-.006)	.009 (.007-.011)	.014 (.011-.017)	.018 (.014-.041)	589
Non-Hispanic blacks (2009 - 2010)	.006 (.005-.008)	.006 (.005-.007)	.010 (.008-.012)	.018 (.013-.021)	.023 (.018-.044)	544
Non-Hispanic whites (1999 - 2000)	.007 (.006-.009)	.007 (.006-.009)	.012 (.010-.015)	.021 (.017-.027)	.030 (.024-.050)	822
Non-Hispanic whites (2001 - 2002)	.008 (.007-.009)	.007 (.006-.009)	.013 (.011-.016)	.025 (.018-.032)	.034 (.025-.051)	1132
Non-Hispanic whites (2003 - 2004)	*	.007 (.006-.008)	.011 (.010-.013)	.019 (.015-.024)	.027 (.020-.040)	1074
Non-Hispanic whites (2005 - 2006)	.006 (.005-.006)	.005 (.005-.006)	.009 (.008-.010)	.016 (.013-.020)	.024 (.019-.039)	1041
Non-Hispanic whites (2007 - 2008)	.007 (.006-.009)	.006 (.005-.008)	.012 (.009-.019)	.025 (.015-.043)	.039 (.024-.081)	1095
Non-Hispanic whites (2009 - 2010)	.007 (.006-.008)	.007 (.006-.008)	.012 (.010-.013)	.018 (.015-.024)	.028 (.021-.035)	1225

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Uranium_BiomonitoringSummary.html

Urinary Uranium (creatinine corrected) (2011 – 2016)

CAS Number 7440-61-1

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.007 (.006-.008)	.007 (.006-.008)	.011 (.009-.014)	.021 (.015-.026)	.029 (.023-.037)	2502
Total population (2013 - 2014)	.006 (.005-.007)	.005 (.004-.006)	.010 (.008-.013)	.020 (.013-.038)	.039 (.021-.064)	2663
Total population (2015 - 2016)	.006 (.005-.007)	.005 (.004-.006)	.009 (.007-.012)	.017 (.013-.023)	.028 (.019-.038)	3058
Age 3-5 years (2015 - 2016)	.009 (.007-.011)	.008 (.007-.012)	.016 (.011-.020)	.023 (.018-.032)	.032 (.025-.039)	485
Age 6-11 years (2011 - 2012)	.009 (.007-.011)	.008 (.007-.010)	.013 (.011-.017)	.023 (.014-.031)	.031 (.018-.080)	398
Age 6-11 years (2013 - 2014)	.008 (.006-.010)	.006 (.005-.009)	.012 (.009-.019)	.028 (.018-.045)	.045 (.022-.081)	402
Age 6-11 years (2015 - 2016)	.006 (.005-.008)	.006 (.005-.008)	.010 (.007-.014)	.016 (.012-.023)	.023 (.017-.038)	379
Age 12-19 years (2011 - 2012)	.007 (.005-.009)	.006 (.005-.009)	.010 (.008-.013)	.016 (.013-.026)	.026 (.015-.059)	390
Age 12-19 years (2013 - 2014)	.005 (.004-.007)	.004 (.004-.005)	.009 (.005-.015)	.021 (.011-.045)	.038 (.018-.051)	451
Age 12-19 years (2015 - 2016)	.005 (.004-.007)	.005 (.003-.006)	.009 (.006-.015)	.021 (.011-.031)	.035 (.021-.051)	402
Age 20+ years (2011 - 2012)	.007 (.006-.008)	.006 (.005-.008)	.011 (.009-.014)	.021 (.015-.027)	.029 (.022-.041)	1714
Age 20+ years (2013 - 2014)	.006 (.005-.007)	.005 (.004-.006)	.010 (.008-.013)	.020 (.014-.036)	.039 (.020-.065)	1810
Age 20+ years (2015 - 2016)	.006 (.005-.007)	.005 (.004-.006)	.009 (.007-.012)	.016 (.013-.022)	.026 (.018-.038)	1792
Males (2011 - 2012)	.006 (.005-.007)	.006 (.005-.007)	.009 (.007-.013)	.017 (.012-.026)	.027 (.017-.052)	1261
Males (2013 - 2014)	.005 (.004-.006)	.005 (.004-.005)	.009 (.006-.012)	.019 (.011-.039)	.034 (.018-.061)	1317
Males (2015 - 2016)	.005 (.004-.006)	.005 (.004-.006)	.008 (.006-.011)	.016 (.010-.021)	.025 (.016-.039)	1524
Females (2011 - 2012)	.008 (.007-.009)	.007 (.006-.009)	.013 (.010-.016)	.022 (.020-.026)	.030 (.026-.036)	1241
Females (2013 - 2014)	.007 (.006-.008)	.006 (.005-.007)	.011 (.009-.013)	.024 (.016-.042)	.046 (.025-.067)	1346
Females (2015 - 2016)	.006 (.005-.007)	.006 (.005-.007)	.010 (.008-.013)	.020 (.014-.025)	.028 (.021-.040)	1534
Mexican Americans (2011 - 2012)	.008 (.006-.011)	.008 (.006-.011)	.013 (.010-.018)	.021 (.014-.030)	.027 (.019-.046)	317
Mexican Americans (2013 - 2014)	.009 (.007-.011)	.008 (.007-.010)	.014 (.011-.020)	.025 (.020-.042)	.042 (.025-.061)	453
Mexican Americans (2015 - 2016)	.007 (.005-.009)	.006 (.005-.008)	.010 (.008-.015)	.018 (.013-.028)	.028 (.019-.038)	584
Non-Hispanic blacks (2011 - 2012)	.005 (.004-.006)	.005 (.004-.006)	.008 (.006-.009)	.013 (.009-.019)	.019 (.014-.030)	669
Non-Hispanic blacks (2013 - 2014)	.004 (.004-.005)	.004 (.004-.004)	.006 (.005-.007)	.011 (.008-.016)	.017 (.011-.026)	581
Non-Hispanic blacks (2015 - 2016)	.005 (.004-.005)	.004 (.004-.005)	.008 (.006-.009)	.013 (.010-.019)	.020 (.014-.028)	669
Non-Hispanic whites (2011 - 2012)	.007 (.006-.009)	.007 (.006-.008)	.012 (.010-.016)	.022 (.018-.028)	.031 (.023-.057)	818
Non-Hispanic whites (2013 - 2014)	.006 (.004-.008)	.005 (.004-.007)	.010 (.007-.015)	.021 (.011-.055)	.039 (.019-.082)	984
Non-Hispanic whites (2015 - 2016)	.006 (.005-.007)	.005 (.004-.007)	.010 (.007-.013)	.019 (.014-.028)	.030 (.021-.040)	924
All Hispanics (2011 - 2012)	.007 (.005-.008)	.007 (.005-.009)	.011 (.009-.014)	.018 (.013-.026)	.025 (.019-.034)	573
All Hispanics (2013 - 2014)	.008 (.006-.009)	.007 (.006-.009)	.013 (.010-.018)	.023 (.019-.035)	.042 (.022-.061)	701
All Hispanics (2015 - 2016)	.006 (.005-.007)	.006 (.004-.007)	.009 (.007-.012)	.017 (.011-.027)	.026 (.018-.043)	981
Asians (2011 - 2012)	.007 (.006-.008)	.007 (.006-.008)	.012 (.010-.013)	.019 (.015-.032)	.033 (.018-.048)	353
Asians (2013 - 2014)	.008 (.006-.012)	.007 (.005-.011)	.014 (.009-.032)	.043 (.015-.085)	.061 (.031-.142)	292
Asians (2015 - 2016)	.005 (.005-.006)	.005 (.004-.005)	.008 (.007-.011)	.016 (.012-.024)	.031 (.020-.038)	332

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Uranium_BiomonitoringSummary.html

Serum Zinc (2011 – 2014)

CAS Number 7440-66-6

Geometric mean and selected percentiles of serum concentrations (in µg/dL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	81.9 (80.9-82.9)	81.8 (80.8-82.9)	91.5 (89.8-93.1)	101 (99.1-104)	109 (105-112)	2329
Total population (2013 - 2014)	80.4 (78.2-82.6)	80.7 (78.4-82.9)	90.5 (88.0-93.1)	101 (97.7-104)	109 (104-113)	2519
Age 6-11 years (2011 - 2012)	81.3 (79.4-83.2)	82.0 (79.2-83.7)	90.3 (86.3-93.4)	101 (93.7-106)	106 (101-114)	316
Age 6-11 years (2013 - 2014)	79.3 (77.4-81.3)	79.4 (77.7-81.0)	88.5 (84.5-91.5)	97.4 (91.4-103)	103 (96.2-114)	339
Age 12-19 years (2011 - 2012)	83.0 (81.5-84.5)	81.9 (79.4-85.0)	94.4 (89.6-96.0)	103 (99.1-105)	106 (103-115)	366
Age 12-19 years (2013 - 2014)	82.8 (80.1-85.6)	84.1 (79.8-87.6)	94.8 (89.4-98.3)	103 (100-108)	110 (102-118)	418
Age 20+ years (2011 - 2012)	81.8 (80.7-83.0)	81.7 (80.6-82.9)	91.3 (89.3-93.4)	101 (98.6-104)	109 (105-114)	1647
Age 20+ years (2013 - 2014)	80.1 (77.9-82.5)	80.5 (78.2-82.5)	90.2 (87.3-92.9)	101 (97.0-105)	109 (103-114)	1762
Males (2011 - 2012)	84.2 (82.7-85.8)	83.9 (82.4-85.4)	94.0 (91.9-96.4)	104 (101-109)	112 (108-117)	1162
Males (2013 - 2014)	82.6 (80.2-85.0)	83.1 (80.6-85.6)	93.3 (90.4-96.3)	105 (100-109)	113 (107-119)	1235
Females (2011 - 2012)	79.8 (78.7-81.0)	79.7 (78.2-81.1)	88.5 (87.3-90.2)	99.6 (95.5-103)	105 (103-108)	1167
Females (2013 - 2014)	78.3 (76.1-80.6)	78.7 (76.0-81.3)	87.5 (84.9-90.1)	97.5 (93.0-102)	103 (101-108)	1284
Mexican Americans (2011 - 2012)	81.4 (77.2-85.7)	81.8 (76.4-86.4)	89.6 (86.5-96.4)	101 (94.3-110)	110 (100-119)	285
Mexican Americans (2013 - 2014)	81.0 (77.6-84.5)	80.8 (77.1-85.8)	92.1 (88.1-98.6)	102 (100-110)	113 (103-119)	431
Non-Hispanic blacks (2011 - 2012)	79.7 (77.9-81.5)	79.4 (77.8-81.3)	90.9 (87.0-93.3)	101 (95.7-106)	108 (103-111)	620
Non-Hispanic blacks (2013 - 2014)	79.1 (75.8-82.5)	78.4 (74.6-83.0)	88.4 (85.8-91.8)	102 (95.1-105)	109 (103-114)	516
Non-Hispanic whites (2011 - 2012)	82.8 (81.3-84.2)	82.9 (81.1-84.5)	92.2 (89.8-94.5)	102 (98.0-105)	109 (103-117)	780
Non-Hispanic whites (2013 - 2014)	80.5 (77.9-83.2)	81.2 (78.7-83.3)	90.4 (87.5-93.3)	101 (96.8-103)	109 (102-113)	975
All Hispanics (2011 - 2012)	80.4 (78.1-82.7)	80.1 (77.5-83.1)	88.8 (86.4-92.4)	100 (96.2-106)	109 (101-116)	525
All Hispanics (2013 - 2014)	81.7 (78.3-85.2)	81.8 (78.4-85.6)	92.2 (87.3-99.5)	103 (99.9-109)	113 (104-123)	666
Asians (2011 - 2012)	81.2 (79.0-83.6)	81.0 (78.6-83.7)	91.3 (88.7-95.1)	101 (97.9-107)	110 (103-114)	323
Asians (2013 - 2014)	78.4 (75.8-81.1)	78.0 (74.8-83.2)	89.7 (85.8-93.0)	100 (96.0-106)	109 (103-112)	266

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 2.9 and 2.9, respectively.

Urinary Nitrate (2001 – 2010)

CAS Number 84145-82-4

Geometric mean and selected percentiles of urine concentrations (in mg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	48.2 (46.2-50.3)	49.0 (46.0-52.0)	78.0 (73.0-83.0)	100 (100-130)	140 (130-150)	1617
Total population (2005 - 2006)	42.7 (39.6-46.1)	47.8 (44.4-51.2)	74.6 (69.8-79.4)	108 (101-114)	133 (125-144)	7697
Total population (2007 - 2008)	46.3 (44.6-48.1)	50.3 (48.4-52.0)	76.0 (72.7-79.1)	110 (104-116)	138 (132-146)	7629
Total population (2009 - 2010)	40.7 (38.9-42.7)	43.3 (41.1-45.8)	68.7 (65.5-72.5)	98.5 (93.4-102)	126 (114-137)	2844
Age 6-11 years (2001 - 2002)	62.2 (53.8-71.8)	68.0 (58.0-79.0)	94.0 (84.0-100)	130 (100-160)	150 (120-380)	374
Age 6-11 years (2005 - 2006)	51.2 (47.4-55.4)	54.7 (51.9-58.2)	79.2 (72.8-87.2)	113 (101-128)	141 (120-158)	1054
Age 6-11 years (2007 - 2008)	55.2 (51.7-58.9)	60.2 (56.1-64.3)	84.5 (80.1-92.5)	117 (107-135)	149 (132-189)	1143
Age 6-11 years (2009 - 2010)	46.8 (43.2-50.6)	50.3 (45.5-58.2)	73.2 (70.2-79.1)	98.7 (86.7-112)	119 (98.0-186)	377
Age 12-19 years (2001 - 2002)	57.4 (53.5-61.6)	66.0 (60.0-69.0)	91.0 (86.0-95.0)	120 (100-130)	150 (130-160)	827
Age 12-19 years (2005 - 2006)	52.5 (48.5-56.8)	57.5 (52.3-62.6)	84.2 (79.9-88.4)	119 (111-124)	144 (129-153)	2106
Age 12-19 years (2007 - 2008)	55.5 (51.5-59.7)	56.8 (51.9-61.5)	84.1 (76.2-94.5)	119 (107-133)	144 (133-162)	1135
Age 12-19 years (2009 - 2010)	44.6 (41.0-48.4)	48.0 (43.3-54.9)	75.2 (70.0-79.4)	106 (91.6-119)	133 (106-163)	452
Age 20+ years (2001 - 2002)	45.4 (43.3-47.5)	49.0 (46.0-52.0)	78.0 (73.0-83.0)	100 (100-130)	140 (130-150)	1617
Age 20+ years (2005 - 2006)	40.5 (37.4-43.9)	45.0 (41.3-48.3)	71.7 (67.1-77.4)	105 (98.0-113)	129 (122-142)	4537
Age 20+ years (2007 - 2008)	44.2 (42.5-45.9)	48.1 (46.0-49.7)	73.2 (70.1-76.5)	107 (101-113)	135 (128-146)	5351
Age 20+ years (2009 - 2010)	39.6 (37.4-41.9)	42.3 (39.4-44.8)	66.4 (62.3-71.9)	97.2 (91.9-102)	124 (113-144)	2015
Males (2001 - 2002)	57.5 (54.6-60.6)	63.0 (59.0-67.0)	89.0 (83.0-94.0)	130 (100-140)	150 (140-170)	1335
Males (2005 - 2006)	48.4 (44.6-52.6)	52.7 (48.3-57.8)	79.4 (72.8-86.5)	110 (103-121)	136 (123-152)	3765
Males (2007 - 2008)	51.9 (49.9-54.1)	56.1 (53.8-58.0)	79.5 (75.7-83.5)	112 (105-119)	137 (131-149)	3839
Males (2009 - 2010)	44.9 (41.8-48.2)	46.0 (43.1-49.7)	73.3 (67.9-77.1)	105 (95.6-112)	133 (117-159)	1401
Females (2001 - 2002)	40.7 (38.4-43.2)	43.0 (41.0-48.0)	72.0 (68.0-76.0)	100 (98.0-120)	130 (120-150)	1483
Females (2005 - 2006)	37.9 (35.1-40.8)	42.0 (38.2-46.0)	69.2 (65.5-73.4)	104 (96.6-110)	130 (124-140)	3932
Females (2007 - 2008)	41.4 (39.3-43.7)	43.9 (41.5-46.3)	71.3 (67.5-74.8)	108 (99.8-115)	138 (132-149)	3790
Females (2009 - 2010)	37.1 (34.9-39.5)	40.3 (36.4-43.9)	65.9 (62.0-69.8)	92.2 (88.4-98.5)	117 (101-130)	1443
Mexican Americans (2001 - 2002)	53.2 (48.7-58.2)	59.0 (52.0-66.0)	84.0 (79.0-91.0)	120 (100-150)	160 (130-180)	707
Mexican Americans (2005 - 2006)	47.8 (44.7-51.2)	52.4 (49.9-56.2)	77.9 (75.1-83.1)	113 (104-120)	148 (133-156)	1972
Mexican Americans (2007 - 2008)	48.7 (45.0-52.6)	51.9 (47.4-56.7)	75.6 (69.7-81.3)	111 (100-122)	148 (127-164)	1505
Mexican Americans (2009 - 2010)	41.3 (39.3-43.5)	43.5 (41.2-46.4)	66.4 (61.0-73.9)	92.6 (86.5-99.7)	111 (94.4-132)	611
Non-Hispanic blacks (2001 - 2002)	53.8 (47.8-60.5)	58.0 (51.0-64.0)	84.0 (77.0-93.0)	120 (100-130)	140 (130-170)	680
Non-Hispanic blacks (2005 - 2006)	45.9 (42.1-50.0)	50.4 (46.6-54.9)	75.0 (68.8-80.8)	101 (95.3-110)	127 (114-148)	2078
Non-Hispanic blacks (2007 - 2008)	47.5 (45.0-50.3)	50.3 (48.6-52.5)	74.7 (71.9-77.3)	105 (97.1-116)	134 (125-150)	1707
Non-Hispanic blacks (2009 - 2010)	39.0 (36.5-41.7)	44.1 (41.6-46.3)	65.4 (61.5-69.6)	94.2 (86.6-101)	121 (101-141)	544
Non-Hispanic whites (2001 - 2002)	46.3 (44.1-48.6)	51.0 (47.0-53.0)	81.0 (78.0-85.0)	120 (100-130)	140 (130-150)	1228
Non-Hispanic whites (2005 - 2006)	41.2 (37.6-45.2)	46.2 (41.3-50.6)	73.3 (67.3-80.1)	107 (98.2-115)	129 (122-142)	3056
Non-Hispanic whites (2007 - 2008)	45.0 (42.7-47.5)	49.2 (46.1-52.6)	75.5 (70.5-80.0)	108 (101-116)	134 (128-140)	3190
Non-Hispanic whites (2009 - 2010)	39.8 (37.2-42.6)	42.1 (39.1-45.2)	68.4 (63.0-73.5)	95.6 (89.8-100)	119 (106-131)	1215

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 05-06, 07-08, and 09-10 are 0.7, 0.7, 0.7, and 0.7 respectively.

Urinary Nitrate (2011 – 2014)

CAS Number 84145-82-4

Geometric mean and selected percentiles of urine concentrations (in mg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	41.8 (39.7-44.1)	44.5 (42.3-47.2)	71.5 (68.1-76.4)	108 (99.3-116)	133 (119-156)	2467
Total population (2013 - 2014)	40.8 (38.8-42.9)	42.2 (39.6-45.7)	72.2 (67.8-78.7)	107 (101-112)	136 (123-151)	2644
Age 6-11 years (2011 - 2012)	47.4 (43.3-52.0)	54.1 (49.2-61.3)	78.6 (74.3-84.0)	99.8 (93.2-113)	121 (104-141)	394
Age 6-11 years (2013 - 2014)	44.7 (41.0-48.8)	47.3 (42.3-51.7)	79.2 (68.9-86.0)	119 (95.8-138)	151 (124-189)	398
Age 12-19 years (2011 - 2012)	43.3 (37.4-50.1)	50.4 (39.8-58.3)	71.5 (66.5-78.0)	107 (91.9-121)	135 (108-183)	384
Age 12-19 years (2013 - 2014)	46.5 (40.8-53.0)	51.1 (42.5-59.3)	83.4 (72.9-89.6)	112 (92.5-120)	122 (115-134)	449
Age 20+ years (2011 - 2012)	41.0 (38.7-43.5)	43.4 (40.8-46.2)	70.1 (66.1-75.7)	110 (98.7-117)	135 (117-164)	1689
Age 20+ years (2013 - 2014)	39.6 (37.6-41.8)	40.7 (38.2-44.1)	70.2 (64.2-76.1)	107 (101-111)	136 (120-153)	1797
Males (2011 - 2012)	46.9 (43.3-50.8)	48.4 (43.6-53.0)	76.2 (69.9-81.7)	114 (101-124)	150 (116-175)	1251
Males (2013 - 2014)	43.6 (40.1-47.4)	45.3 (41.0-50.6)	73.1 (64.3-83.5)	108 (99.8-113)	141 (118-157)	1313
Females (2011 - 2012)	37.4 (34.4-40.7)	41.2 (36.4-46.0)	67.9 (60.6-73.7)	101 (89.8-114)	120 (113-145)	1216
Females (2013 - 2014)	38.2 (36.1-40.5)	39.2 (37.5-41.7)	71.4 (67.8-74.8)	107 (99.8-112)	134 (120-141)	1331
Mexican Americans (2011 - 2012)	41.1 (36.9-45.8)	45.9 (40.4-51.3)	65.9 (61.8-70.9)	89.8 (78.4-108)	112 (89.8-159)	313
Mexican Americans (2013 - 2014)	42.0 (36.0-49.0)	45.3 (35.4-56.6)	72.0 (61.7-83.4)	111 (93.0-134)	136 (111-163)	451
Non-Hispanic blacks (2011 - 2012)	44.9 (41.5-48.6)	47.6 (41.6-52.3)	73.8 (67.8-79.8)	107 (97.1-117)	139 (116-150)	663
Non-Hispanic blacks (2013 - 2014)	46.4 (42.4-50.9)	50.0 (44.9-54.4)	73.6 (66.4-80.6)	105 (92.1-119)	135 (107-172)	574
Non-Hispanic whites (2011 - 2012)	41.0 (38.0-44.1)	43.6 (39.6-47.9)	71.9 (66.7-78.0)	110 (96.1-117)	132 (115-169)	810
Non-Hispanic whites (2013 - 2014)	39.3 (36.6-42.3)	40.2 (37.6-43.9)	71.9 (64.5-80.9)	107 (95.9-111)	128 (114-145)	976
All Hispanics (2011 - 2012)	41.0 (36.7-45.7)	44.4 (40.2-48.9)	67.2 (60.9-73.9)	95.3 (82.9-113)	120 (97.0-159)	566
All Hispanics (2013 - 2014)	41.1 (36.8-45.8)	44.4 (39.0-50.5)	70.0 (62.7-76.7)	107 (94.2-116)	138 (120-153)	699
Asians (2011 - 2012)	50.2 (43.7-57.6)	50.8 (45.8-57.5)	84.0 (72.1-91.9)	146 (121-171)	238 (142-380)	341
Asians (2013 - 2014)	44.4 (38.9-50.7)	45.2 (36.6-53.0)	91.6 (76.2-99.5)	150 (114-183)	189 (139-282)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.7 and 0.7, respectively.

Urinary Nitrate (creatinine corrected) (2001 – 2010)

CAS Number 84145-82-4

Geometric mean and selected percentiles of urine concentrations (in mg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	49.8 (47.7-51.9)	46.9 (44.2-49.6)	63.8 (61.2-67.7)	90.9 (84.3-98.8)	120 (111-128)	1616
Total population (2005 - 2006)	42.6 (40.2-45.1)	42.4 (40.1-44.7)	59.7 (55.8-64.1)	85.5 (81.3-91.3)	113 (106-118)	7697
Total population (2007 - 2008)	47.7 (45.9-49.7)	46.0 (44.0-48.3)	66.5 (62.4-70.5)	98.0 (92.3-102)	127 (119-135)	7628
Total population (2009 - 2010)	43.7 (42.1-45.3)	42.3 (41.0-43.7)	60.2 (57.6-63.0)	88.5 (83.3-96.1)	115 (104-127)	2843
Age 6-11 years (2001 - 2002)	72.0 (66.1-78.4)	66.0 (62.6-70.4)	87.0 (80.2-97.7)	129 (96.5-144)	144 (130-235)	374
Age 6-11 years (2005 - 2006)	60.8 (57.4-64.5)	57.3 (53.6-60.6)	76.5 (70.9-82.1)	109 (95.0-123)	134 (121-164)	1054
Age 6-11 years (2007 - 2008)	70.2 (65.7-74.9)	65.9 (62.4-69.5)	89.0 (83.2-96.5)	128 (112-152)	173 (140-216)	1143
Age 6-11 years (2009 - 2010)	64.2 (58.8-70.0)	60.2 (56.3-63.3)	80.7 (68.9-96.1)	107 (96.1-124)	127 (105-202)	376
Age 12-19 years (2001 - 2002)	44.8 (43.4-46.2)	43.8 (42.6-45.0)	56.2 (52.2-59.7)	73.2 (65.2-85.1)	93.4 (79.0-104)	826
Age 12-19 years (2005 - 2006)	39.8 (37.8-41.9)	38.1 (36.3-40.3)	51.8 (47.7-56.0)	70.6 (63.1-78.8)	88.9 (79.4-103)	2106
Age 12-19 years (2007 - 2008)	43.4 (41.3-45.5)	40.5 (38.6-43.5)	56.0 (52.7-59.2)	76.6 (69.0-86.2)	98.0 (85.4-121)	1134
Age 12-19 years (2009 - 2010)	41.7 (39.3-44.4)	39.7 (38.3-41.7)	54.0 (48.4-57.4)	73.4 (61.0-86.1)	88.5 (71.0-117)	452
Age 20+ years (2001 - 2002)	48.3 (45.9-50.9)	46.9 (44.2-49.6)	63.8 (61.2-67.7)	90.9 (84.3-98.8)	120 (111-128)	1616
Age 20+ years (2005 - 2006)	41.4 (38.9-43.9)	41.0 (38.8-43.7)	58.6 (54.8-63.1)	85.3 (80.2-91.0)	111 (105-116)	4537
Age 20+ years (2007 - 2008)	46.5 (44.6-48.4)	44.7 (42.5-47.0)	65.0 (60.7-69.2)	96.1 (90.0-102)	125 (117-132)	5351
Age 20+ years (2009 - 2010)	42.2 (40.3-44.2)	41.0 (39.6-42.5)	58.6 (55.4-62.2)	87.7 (81.0-98.5)	116 (103-133)	2015
Males (2001 - 2002)	47.6 (44.7-50.7)	46.1 (43.4-48.7)	61.3 (58.0-64.5)	86.7 (77.1-97.3)	114 (97.3-125)	1335
Males (2005 - 2006)	40.1 (37.5-42.9)	39.5 (36.7-42.8)	55.3 (51.6-59.5)	77.2 (70.7-83.0)	95.9 (89.6-102)	3765
Males (2007 - 2008)	44.6 (42.8-46.6)	42.8 (40.7-45.1)	60.6 (58.1-64.4)	85.6 (81.1-91.3)	111 (101-121)	3839
Males (2009 - 2010)	41.0 (38.9-43.1)	39.1 (37.6-40.6)	54.6 (52.2-58.1)	83.3 (74.6-90.0)	103 (96.1-122)	1400
Females (2001 - 2002)	51.9 (49.9-54.1)	51.2 (48.4-53.0)	69.1 (66.7-71.2)	100 (91.7-111)	129 (118-140)	1481
Females (2005 - 2006)	45.1 (42.8-47.6)	45.0 (42.4-47.4)	64.4 (60.0-69.6)	96.8 (87.8-105)	128 (117-134)	3932
Females (2007 - 2008)	51.0 (48.9-53.2)	50.0 (47.5-52.7)	72.3 (67.8-76.8)	107 (101-116)	146 (129-163)	3789
Females (2009 - 2010)	46.5 (44.4-48.7)	46.5 (44.8-48.4)	64.2 (60.5-69.4)	96.6 (83.3-106)	121 (106-152)	1443
Mexican Americans (2001 - 2002)	50.9 (45.7-56.8)	48.1 (44.9-51.4)	67.4 (60.3-77.6)	97.3 (85.7-117)	135 (100-161)	707
Mexican Americans (2005 - 2006)	44.6 (42.6-46.7)	44.0 (42.2-45.3)	60.4 (58.1-62.9)	89.9 (82.0-95.4)	120 (111-128)	1972
Mexican Americans (2007 - 2008)	48.7 (45.1-52.7)	47.0 (43.5-50.5)	64.8 (59.7-69.9)	93.5 (88.9-101)	128 (108-156)	1505
Mexican Americans (2009 - 2010)	43.4 (40.5-46.5)	42.2 (39.7-45.9)	58.2 (54.7-61.3)	86.2 (77.1-92.5)	104 (90.8-122)	611
Non-Hispanic blacks (2001 - 2002)	38.7 (36.3-41.3)	38.0 (34.6-41.3)	53.5 (50.3-57.4)	70.3 (64.9-79.3)	91.7 (78.9-100)	679
Non-Hispanic blacks (2005 - 2006)	32.9 (30.9-35.0)	31.9 (29.8-34.1)	45.4 (41.5-49.6)	64.0 (60.1-68.0)	81.2 (75.3-89.6)	2078
Non-Hispanic blacks (2007 - 2008)	35.9 (34.2-37.7)	34.8 (33.3-36.6)	49.0 (44.8-53.6)	69.1 (63.5-77.4)	87.8 (78.1-97.4)	1706
Non-Hispanic blacks (2009 - 2010)	31.4 (28.9-34.0)	32.2 (29.7-34.5)	43.3 (40.8-47.3)	59.9 (54.8-69.7)	77.1 (62.2-98.3)	543
Non-Hispanic whites (2001 - 2002)	51.4 (49.4-53.4)	49.1 (46.9-51.5)	66.9 (64.2-69.4)	95.2 (87.7-100)	124 (115-132)	1227
Non-Hispanic whites (2005 - 2006)	43.7 (40.8-46.8)	43.9 (40.8-46.8)	61.4 (56.5-66.2)	85.5 (80.6-91.9)	110 (102-116)	3056
Non-Hispanic whites (2007 - 2008)	49.0 (46.7-51.4)	47.4 (44.9-50.5)	68.2 (63.3-73.1)	98.3 (91.2-105)	126 (118-135)	3190
Non-Hispanic whites (2009 - 2010)	44.7 (42.7-46.9)	43.8 (41.5-46.1)	62.0 (58.6-64.7)	87.7 (83.3-96.1)	106 (103-117)	1215

Urinary Nitrate (creatinine corrected) (2011 – 2014)

CAS Number 84145-82-4

Geometric mean and selected percentiles of urine concentrations (in mg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	47.8 (45.3-50.4)	46.0 (43.7-49.2)	67.4 (62.6-71.5)	103 (88.7-117)	137 (117-153)	2465
Total population (2013 - 2014)	47.2 (45.2-49.4)	46.3 (43.2-49.4)	66.2 (62.9-70.2)	97.3 (91.0-104)	123 (116-133)	2643
Age 6-11 years (2011 - 2012)	68.0 (63.3-73.1)	66.4 (60.9-68.7)	87.3 (81.2-95.6)	122 (110-132)	144 (124-156)	393
Age 6-11 years (2013 - 2014)	67.1 (62.3-72.2)	63.2 (59.4-67.1)	83.6 (72.4-95.2)	118 (99.1-145)	159 (110-230)	398
Age 12-19 years (2011 - 2012)	42.2 (39.6-44.9)	41.5 (38.7-43.8)	54.0 (51.2-57.7)	69.1 (63.6-77.1)	86.9 (69.1-104)	384
Age 12-19 years (2013 - 2014)	42.2 (39.7-44.8)	41.9 (37.2-44.7)	52.8 (47.9-58.1)	69.2 (61.0-82.0)	85.6 (72.6-107)	449
Age 20+ years (2011 - 2012)	46.8 (44.0-49.8)	44.9 (41.7-47.9)	66.8 (60.5-73.0)	105 (87.4-122)	142 (116-165)	1688
Age 20+ years (2013 - 2014)	46.3 (44.2-48.5)	45.2 (42.5-48.2)	66.0 (62.8-70.2)	97.4 (90.5-105)	123 (113-136)	1796
Males (2011 - 2012)	44.1 (41.8-46.6)	43.8 (40.8-45.9)	59.8 (57.0-62.4)	87.1 (76.9-98.4)	109 (98.4-120)	1250
Males (2013 - 2014)	43.7 (41.4-46.2)	42.5 (38.9-45.6)	59.8 (55.7-65.5)	84.0 (78.6-94.3)	110 (99.1-128)	1312
Females (2011 - 2012)	51.6 (47.9-55.5)	50.0 (45.8-54.0)	76.5 (68.9-85.1)	120 (98.1-143)	151 (132-170)	1215
Females (2013 - 2014)	50.9 (48.2-53.7)	50.5 (47.1-53.5)	71.6 (67.8-75.7)	107 (95.6-113)	135 (118-156)	1331
Mexican Americans (2011 - 2012)	46.4 (41.0-52.6)	43.6 (38.9-49.7)	62.4 (52.7-78.0)	86.4 (72.1-124)	110 (84.0-203)	313
Mexican Americans (2013 - 2014)	48.1 (43.4-53.2)	48.3 (46.0-50.9)	67.3 (62.1-72.0)	99.3 (83.0-116)	128 (100-169)	451
Non-Hispanic blacks (2011 - 2012)	35.0 (33.2-36.9)	34.3 (32.1-36.3)	47.5 (44.0-51.3)	69.2 (62.2-78.1)	89.3 (77.1-102)	663
Non-Hispanic blacks (2013 - 2014)	35.5 (33.4-37.8)	33.8 (32.0-35.9)	46.2 (43.5-49.7)	67.3 (60.4-75.0)	87.3 (76.6-95.6)	574
Non-Hispanic whites (2011 - 2012)	50.1 (47.2-53.2)	49.0 (45.7-52.3)	68.9 (63.8-79.4)	107 (91.1-129)	144 (121-154)	808
Non-Hispanic whites (2013 - 2014)	48.6 (46.3-50.9)	47.9 (44.8-51.4)	67.8 (62.9-72.5)	97.4 (89.5-105)	122 (109-136)	975
All Hispanics (2011 - 2012)	45.8 (42.4-49.5)	44.1 (41.7-46.2)	61.5 (55.4-69.3)	85.2 (78.5-95.6)	115 (86.4-159)	566
All Hispanics (2013 - 2014)	45.9 (43.1-48.9)	46.1 (43.1-48.3)	65.5 (61.0-68.6)	95.4 (85.0-105)	126 (105-137)	699
Asians (2011 - 2012)	67.2 (61.9-72.9)	62.9 (56.3-68.8)	106 (93.3-118)	178 (153-216)	247 (203-318)	341
Asians (2013 - 2014)	69.6 (62.2-78.0)	62.7 (52.5-76.8)	101 (85.2-132)	168 (140-194)	200 (173-261)	291

Urinary Perchlorate (2001 – 2010)

CAS Number 14797-73-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	3.72 (3.46-4.01)	3.70 (3.40-3.90)	6.20 (5.60-6.90)	10.0 (8.90-12.0)	14.0 (12.0-18.0)	1618
Total population (2003 - 2004)	3.39 (3.08-3.73)	3.50 (3.00-4.00)	5.80 (5.20-6.70)	10.0 (8.80-12.0)	14.0 (13.0-16.0)	2522
Total population (2005 - 2006)	3.47 (3.20-3.76)	3.62 (3.35-3.98)	6.10 (5.67-6.52)	9.76 (9.19-10.5)	13.4 (12.4-14.6)	7697
Total population (2007 - 2008)	3.88 (3.60-4.18)	3.96 (3.59-4.30)	7.10 (6.50-7.74)	12.0 (11.2-13.0)	17.3 (16.1-18.8)	7629
Total population (2009 - 2010)	3.38 (3.19-3.58)	3.44 (3.17-3.61)	5.95 (5.66-6.35)	10.1 (9.20-10.6)	13.8 (12.2-15.4)	2844
Age 6-11 years (2001 - 2002)	5.19 (4.44-6.05)	5.50 (4.60-6.70)	8.50 (7.20-10.0)	13.0 (9.80-20.0)	20.0 (13.0-24.0)	374
Age 6-11 years (2003 - 2004)	4.54 (3.85-5.36)	4.80 (4.20-5.50)	8.30 (6.00-10.0)	14.0 (9.20-17.0)	17.0 (12.0-30.0)	314
Age 6-11 years (2005 - 2006)	4.64 (4.15-5.18)	4.81 (4.26-5.38)	7.67 (6.71-8.60)	11.6 (10.0-12.7)	14.1 (12.4-16.3)	1054
Age 6-11 years (2007 - 2008)	4.88 (4.31-5.53)	4.86 (4.22-5.93)	9.11 (7.84-10.3)	14.4 (12.1-16.9)	18.9 (16.1-23.2)	1143
Age 6-11 years (2009 - 2010)	4.47 (3.88-5.15)	5.03 (3.84-5.98)	7.98 (6.86-9.68)	12.2 (10.1-15.7)	16.2 (11.2-24.5)	377
Age 12-19 years (2001 - 2002)	4.00 (3.62-4.42)	4.60 (4.00-5.00)	7.10 (6.60-7.70)	10.0 (9.70-12.0)	14.0 (12.0-18.0)	828
Age 12-19 years (2003 - 2004)	3.81 (3.35-4.33)	4.00 (3.40-4.60)	6.70 (5.80-7.40)	10.0 (8.20-13.0)	14.0 (10.0-19.0)	721
Age 12-19 years (2005 - 2006)	4.14 (3.77-4.53)	4.25 (3.94-4.65)	7.00 (6.41-7.69)	10.9 (9.71-12.4)	15.6 (12.4-17.9)	2106
Age 12-19 years (2007 - 2008)	4.50 (4.06-4.97)	4.73 (4.39-5.05)	7.93 (6.89-8.89)	13.0 (11.1-15.4)	17.7 (15.8-20.2)	1135
Age 12-19 years (2009 - 2010)	3.36 (2.89-3.91)	3.33 (2.86-3.98)	6.21 (5.22-7.82)	10.7 (8.58-13.2)	15.1 (12.0-19.4)	452
Age 20+ years (2001 - 2002)	3.53 (3.24-3.84)	3.70 (3.40-3.90)	6.20 (5.60-6.90)	10.0 (8.90-12.0)	14.0 (12.0-18.0)	1618
Age 20+ years (2003 - 2004)	3.21 (2.89-3.56)	3.40 (2.80-3.80)	5.50 (4.90-6.40)	9.50 (8.30-10.0)	13.0 (12.0-15.0)	1487
Age 20+ years (2005 - 2006)	3.27 (3.01-3.55)	3.42 (3.14-3.72)	5.75 (5.33-6.21)	9.38 (8.73-9.86)	13.1 (12.2-14.5)	4537
Age 20+ years (2007 - 2008)	3.70 (3.43-3.99)	3.69 (3.42-4.09)	6.75 (6.09-7.38)	11.6 (10.8-12.7)	16.8 (15.4-18.7)	5351
Age 20+ years (2009 - 2010)	3.29 (3.08-3.51)	3.28 (3.00-3.59)	5.68 (5.47-6.05)	9.55 (8.72-10.3)	13.3 (11.2-15.2)	2015
Males (2001 - 2002)	4.41 (4.13-4.70)	4.60 (4.40-4.80)	7.40 (6.70-8.30)	12.0 (10.0-13.0)	15.0 (12.0-20.0)	1335
Males (2003 - 2004)	3.95 (3.56-4.37)	4.10 (3.60-4.60)	6.70 (5.90-7.90)	12.0 (9.70-13.0)	15.0 (14.0-18.0)	1229
Males (2005 - 2006)	3.93 (3.64-4.25)	4.07 (3.77-4.38)	6.50 (6.11-6.92)	10.4 (9.65-11.6)	14.7 (13.2-16.3)	3765
Males (2007 - 2008)	4.40 (4.13-4.70)	4.42 (4.12-4.78)	7.90 (7.16-8.46)	13.3 (12.0-14.4)	18.6 (17.0-19.7)	3839
Males (2009 - 2010)	3.66 (3.40-3.95)	3.74 (3.36-4.00)	6.21 (5.70-6.65)	10.2 (9.10-11.2)	14.6 (11.9-18.2)	1401
Females (2001 - 2002)	3.17 (2.89-3.48)	3.30 (2.80-3.60)	5.70 (5.20-6.30)	9.70 (8.60-12.0)	14.0 (12.0-18.0)	1485
Females (2003 - 2004)	2.93 (2.62-3.28)	3.00 (2.60-3.40)	5.10 (4.60-5.80)	8.60 (7.20-10.0)	12.0 (9.20-16.0)	1293
Females (2005 - 2006)	3.08 (2.80-3.38)	3.24 (2.96-3.51)	5.55 (5.14-6.07)	9.20 (8.22-10.3)	12.4 (11.3-14.2)	3932
Females (2007 - 2008)	3.42 (3.11-3.76)	3.44 (3.10-3.79)	6.41 (5.95-7.01)	10.8 (10.0-12.0)	16.0 (14.1-17.9)	3790
Females (2009 - 2010)	3.13 (2.93-3.34)	3.11 (2.83-3.37)	5.83 (5.36-6.28)	9.73 (8.44-10.6)	13.2 (11.0-15.4)	1443

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, & 07-08, and 09-10 are 0.05, 0.05, & 0.05, 0.05, and 0.05 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Perchlorate_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Perchlorate_FactSheet.html

Urinary Perchlorate (2001 – 2010)

CAS Number 14797-73-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	4.23 (3.65-4.90)	4.60 (3.90-5.20)	7.40 (6.10-8.80)	13.0 (9.90-14.0)	15.0 (13.0-19.0)	708
Mexican Americans (2003 - 2004)	3.96 (3.63-4.32)	4.20 (3.70-4.60)	6.50 (5.60-7.90)	12.0 (9.50-13.0)	16.0 (13.0-18.0)	617
Mexican Americans (2005 - 2006)	4.02 (3.77-4.28)	4.16 (3.84-4.46)	6.93 (6.62-7.26)	11.3 (10.4-12.0)	15.7 (14.6-16.8)	1972
Mexican Americans (2007 - 2008)	4.20 (3.95-4.46)	4.38 (4.08-4.65)	7.32 (6.73-7.95)	12.1 (10.9-14.0)	16.7 (15.0-17.7)	1505
Mexican Americans (2009 - 2010)	3.98 (3.51-4.51)	3.99 (3.45-4.54)	7.27 (6.06-8.20)	11.3 (9.97-13.4)	17.2 (12.0-24.5)	611
Non-Hispanic blacks (2001 - 2002)	3.69 (3.22-4.23)	3.90 (3.30-4.30)	6.20 (5.30-7.30)	9.70 (8.20-13.0)	16.0 (12.0-21.0)	681
Non-Hispanic blacks (2003 - 2004)	3.38 (3.05-3.74)	3.40 (3.00-3.70)	5.70 (4.80-6.60)	9.00 (7.90-12.0)	14.0 (9.80-18.0)	652
Non-Hispanic blacks (2005 - 2006)	3.48 (3.19-3.80)	3.54 (3.24-3.94)	5.95 (5.33-6.65)	9.99 (9.02-11.0)	14.4 (12.8-15.7)	2078
Non-Hispanic blacks (2007 - 2008)	3.82 (3.37-4.33)	3.82 (3.37-4.48)	6.96 (6.18-7.97)	12.0 (10.6-13.8)	17.2 (14.3-20.6)	1707
Non-Hispanic blacks (2009 - 2010)	2.98 (2.74-3.26)	2.94 (2.64-3.27)	5.31 (4.88-5.99)	9.06 (7.90-10.2)	12.7 (9.23-17.3)	544
Non-Hispanic whites (2001 - 2002)	3.70 (3.35-4.08)	3.90 (3.60-4.30)	6.60 (6.00-7.40)	10.0 (9.20-12.0)	15.0 (12.0-19.0)	1228
Non-Hispanic whites (2003 - 2004)	3.43 (3.04-3.86)	3.50 (2.90-4.20)	5.90 (5.10-7.10)	9.90 (8.50-12.0)	14.0 (12.0-16.0)	1092
Non-Hispanic whites (2005 - 2006)	3.42 (3.08-3.80)	3.59 (3.23-4.04)	6.05 (5.52-6.55)	9.62 (8.90-10.5)	13.2 (11.9-14.8)	3056
Non-Hispanic whites (2007 - 2008)	3.84 (3.52-4.18)	3.93 (3.48-4.36)	7.07 (6.37-7.77)	11.7 (10.8-12.7)	16.8 (15.3-18.4)	3190
Non-Hispanic whites (2009 - 2010)	3.40 (3.21-3.61)	3.48 (3.17-3.68)	5.94 (5.60-6.40)	9.69 (8.78-10.3)	13.6 (11.2-15.5)	1215

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, &fyr4., 07-08, and 09-10 are 0.05, 0.05, &lod4., 0.05, and 0.05 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Perchlorate_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Perchlorate_FactSheet.html

Urinary Perchlorate (2011 – 2014)

CAS Number 14797-73-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	2.96 (2.79-3.14)	3.01 (2.82-3.24)	5.46 (5.11-5.71)	9.11 (8.46-9.78)	12.8 (11.4-14.2)	2467
Total population (2013 - 2014)	2.63 (2.44-2.83)	2.62 (2.40-2.83)	4.76 (4.51-5.08)	7.92 (7.26-8.57)	10.6 (9.43-11.9)	2644
Age 6-11 years (2011 - 2012)	3.89 (3.45-4.39)	4.31 (3.67-4.86)	6.41 (5.88-7.17)	10.6 (8.97-12.8)	14.9 (12.7-18.5)	394
Age 6-11 years (2013 - 2014)	3.37 (2.96-3.84)	3.56 (2.95-4.14)	5.61 (4.95-7.08)	9.38 (7.52-10.6)	12.1 (9.70-21.2)	398
Age 12-19 years (2011 - 2012)	2.77 (2.33-3.30)	2.82 (2.39-3.60)	5.15 (4.28-5.71)	7.54 (6.40-8.68)	10.8 (7.54-13.3)	384
Age 12-19 years (2013 - 2014)	2.86 (2.42-3.37)	2.91 (2.47-3.45)	5.11 (3.96-6.69)	9.43 (7.11-10.9)	13.9 (9.83-24.0)	449
Age 20+ years (2011 - 2012)	2.90 (2.71-3.10)	2.95 (2.75-3.14)	5.30 (4.94-5.73)	9.16 (8.46-10.3)	12.8 (11.2-14.6)	1689
Age 20+ years (2013 - 2014)	2.53 (2.34-2.73)	2.44 (2.25-2.76)	4.57 (4.22-4.93)	7.67 (6.94-8.29)	10.2 (8.93-11.7)	1797
Males (2011 - 2012)	3.32 (3.05-3.61)	3.43 (3.22-3.67)	5.79 (5.45-6.58)	10.3 (8.70-10.8)	13.3 (11.7-14.6)	1251
Males (2013 - 2014)	2.73 (2.47-3.03)	2.85 (2.58-3.13)	4.84 (4.53-5.33)	8.18 (6.97-9.43)	11.0 (9.87-13.4)	1313
Females (2011 - 2012)	2.65 (2.44-2.87)	2.64 (2.40-2.96)	4.86 (4.20-5.52)	8.21 (7.78-8.86)	11.7 (10.6-13.2)	1216
Females (2013 - 2014)	2.53 (2.36-2.70)	2.40 (2.21-2.62)	4.67 (4.14-5.21)	7.81 (7.00-8.45)	9.83 (8.73-11.7)	1331
Mexican Americans (2011 - 2012)	3.46 (2.97-4.02)	3.47 (2.83-3.90)	6.06 (4.99-7.38)	10.5 (7.19-16.4)	15.3 (10.1-24.2)	313
Mexican Americans (2013 - 2014)	3.02 (2.67-3.42)	3.08 (2.70-3.42)	4.95 (4.55-5.75)	8.69 (6.98-11.5)	12.6 (8.71-18.8)	451
Non-Hispanic blacks (2011 - 2012)	2.92 (2.69-3.16)	2.91 (2.64-3.27)	5.48 (4.72-5.96)	9.02 (8.11-10.8)	12.2 (11.3-14.7)	663
Non-Hispanic blacks (2013 - 2014)	2.75 (2.47-3.06)	2.81 (2.49-3.06)	4.76 (4.17-5.42)	7.78 (6.82-8.59)	11.9 (7.92-15.1)	574
Non-Hispanic whites (2011 - 2012)	2.93 (2.75-3.13)	3.07 (2.81-3.31)	5.44 (5.04-5.73)	8.70 (8.05-10.4)	12.7 (10.8-14.2)	810
Non-Hispanic whites (2013 - 2014)	2.57 (2.39-2.77)	2.52 (2.29-2.81)	4.73 (4.37-5.11)	7.70 (7.02-8.29)	9.54 (8.80-10.8)	976
All Hispanics (2011 - 2012)	3.15 (2.81-3.52)	2.99 (2.52-3.50)	5.49 (4.67-6.27)	9.51 (7.38-11.6)	13.2 (10.4-18.4)	566
All Hispanics (2013 - 2014)	2.84 (2.51-3.21)	2.82 (2.56-3.16)	4.84 (4.39-5.72)	8.67 (7.00-11.0)	12.6 (9.82-18.8)	699
Asians (2011 - 2012)	2.81 (2.44-3.24)	2.82 (2.36-3.22)	5.48 (4.82-6.39)	9.48 (7.86-12.3)	15.1 (10.3-23.6)	341
Asians (2013 - 2014)	2.42 (1.97-2.97)	2.36 (1.76-3.27)	5.02 (3.91-6.25)	9.29 (7.70-10.4)	12.1 (10.2-14.0)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.05 and 0.05, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Perchlorate_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Perchlorate_FactSheet.html

Urinary Perchlorate (creatinine corrected) (2001 – 2010)

CAS Number 14797-73-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	3.74 (3.51-3.99)	3.44 (3.18-3.79)	5.70 (5.27-6.18)	9.47 (7.88-10.8)	12.9 (10.7-14.9)	1617
Total population (2003 - 2004)	3.31 (3.04-3.59)	3.18 (2.90-3.45)	5.19 (4.80-5.55)	8.86 (7.69-10.0)	12.4 (11.2-14.5)	2519
Total population (2005 - 2006)	3.46 (3.27-3.66)	3.37 (3.17-3.59)	5.42 (5.08-5.86)	8.56 (8.19-9.17)	11.6 (10.4-13.4)	7697
Total population (2007 - 2008)	4.00 (3.69-4.33)	3.89 (3.59-4.26)	6.59 (6.10-7.13)	10.9 (10.1-11.8)	15.7 (14.6-16.8)	7628
Total population (2009 - 2010)	3.62 (3.48-3.77)	3.51 (3.37-3.72)	5.84 (5.57-6.10)	9.42 (8.73-10.3)	13.1 (11.4-14.1)	2843
Age 6-11 years (2001 - 2002)	6.01 (5.49-6.57)	6.10 (5.37-6.67)	8.68 (7.72-10.6)	13.6 (11.6-17.3)	18.6 (13.7-23.7)	374
Age 6-11 years (2003 - 2004)	5.52 (4.86-6.28)	5.34 (4.92-5.78)	7.64 (6.67-10.5)	13.5 (9.66-21.3)	21.3 (12.0-46.9)	314
Age 6-11 years (2005 - 2006)	5.51 (5.06-6.00)	5.66 (5.08-6.22)	8.39 (7.61-9.25)	12.3 (10.3-13.6)	15.4 (14.3-17.0)	1054
Age 6-11 years (2007 - 2008)	6.21 (5.52-6.99)	6.34 (5.56-7.10)	9.78 (8.63-11.3)	14.7 (13.3-16.0)	20.6 (16.4-25.0)	1143
Age 6-11 years (2009 - 2010)	6.14 (5.51-6.84)	6.10 (5.40-6.94)	10.3 (7.79-13.3)	16.2 (14.1-17.6)	20.2 (15.8-25.5)	376
Age 12-19 years (2001 - 2002)	3.10 (2.77-3.46)	3.04 (2.67-3.53)	4.75 (4.20-5.48)	7.50 (6.82-8.26)	10.4 (7.90-14.1)	827
Age 12-19 years (2003 - 2004)	2.85 (2.59-3.14)	2.83 (2.62-3.17)	4.39 (3.88-4.67)	6.63 (5.56-7.82)	8.62 (7.24-11.4)	719
Age 12-19 years (2005 - 2006)	3.14 (2.89-3.41)	3.17 (2.87-3.40)	4.86 (4.32-5.41)	7.30 (6.40-8.43)	9.54 (8.46-11.0)	2106
Age 12-19 years (2007 - 2008)	3.52 (3.27-3.78)	3.43 (3.07-3.80)	5.62 (5.13-6.11)	8.84 (7.70-9.73)	12.6 (10.4-15.8)	1134
Age 12-19 years (2009 - 2010)	3.15 (2.87-3.45)	3.05 (2.75-3.50)	4.79 (4.14-5.74)	8.20 (6.29-8.96)	9.70 (8.73-11.0)	452
Age 20+ years (2001 - 2002)	3.64 (3.37-3.93)	3.44 (3.18-3.79)	5.70 (5.27-6.18)	9.47 (7.88-10.8)	12.9 (10.7-14.9)	1617
Age 20+ years (2003 - 2004)	3.18 (2.90-3.49)	3.02 (2.74-3.33)	4.94 (4.53-5.35)	8.64 (7.18-10.0)	11.7 (10.3-15.2)	1486
Age 20+ years (2005 - 2006)	3.34 (3.15-3.53)	3.24 (3.08-3.45)	5.12 (4.82-5.45)	8.24 (7.67-8.64)	11.4 (10.0-13.0)	4537
Age 20+ years (2007 - 2008)	3.88 (3.57-4.22)	3.77 (3.49-4.14)	6.35 (5.85-6.91)	10.5 (9.64-11.5)	15.4 (13.6-16.9)	5351
Age 20+ years (2009 - 2010)	3.50 (3.33-3.68)	3.44 (3.23-3.61)	5.59 (5.20-5.94)	8.91 (7.93-9.70)	12.2 (10.5-13.7)	2015
Males (2001 - 2002)	3.57 (3.36-3.79)	3.42 (3.17-3.67)	5.62 (5.22-6.12)	9.24 (7.87-10.3)	12.2 (10.9-13.3)	1335
Males (2003 - 2004)	3.23 (2.96-3.52)	3.09 (2.83-3.33)	5.00 (4.60-5.55)	8.00 (6.86-10.2)	12.5 (10.2-15.3)	1228
Males (2005 - 2006)	3.25 (3.08-3.44)	3.16 (2.99-3.36)	4.98 (4.71-5.37)	8.07 (7.60-8.58)	11.0 (10.0-12.9)	3765
Males (2007 - 2008)	3.78 (3.47-4.12)	3.64 (3.28-4.03)	6.29 (5.72-6.85)	10.3 (9.28-11.3)	14.4 (13.1-15.5)	3839
Males (2009 - 2010)	3.34 (3.19-3.51)	3.25 (2.98-3.48)	5.21 (4.95-5.77)	9.08 (7.91-9.90)	13.1 (10.4-15.0)	1400
Females (2001 - 2002)	3.92 (3.57-4.30)	3.79 (3.36-4.31)	6.33 (5.65-7.00)	10.6 (8.64-12.6)	14.0 (11.8-17.0)	1483
Females (2003 - 2004)	3.38 (3.02-3.78)	3.28 (2.90-3.61)	5.24 (4.73-6.00)	9.40 (7.24-11.4)	12.4 (10.7-15.2)	1291
Females (2005 - 2006)	3.67 (3.43-3.93)	3.58 (3.31-3.91)	5.86 (5.39-6.19)	9.21 (8.35-9.77)	12.1 (10.5-14.5)	3932
Females (2007 - 2008)	4.22 (3.90-4.56)	4.16 (3.81-4.55)	6.89 (6.40-7.54)	11.5 (10.4-12.6)	16.6 (14.5-18.6)	3789
Females (2009 - 2010)	3.92 (3.71-4.13)	3.89 (3.68-4.07)	6.16 (5.83-6.74)	9.58 (8.68-10.7)	13.2 (10.8-16.1)	1443

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Perchlorate_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Perchlorate_FactSheet.html

Urinary Perchlorate (creatinine corrected) (2001 – 2010)

CAS Number 14797-73-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	3.96 (3.39-4.63)	3.71 (3.15-4.69)	6.18 (5.06-8.13)	10.9 (8.78-14.0)	15.3 (12.2-18.6)	708
Mexican Americans (2003 - 2004)	3.59 (3.32-3.88)	3.45 (3.10-3.68)	5.69 (4.82-6.45)	9.77 (8.00-11.2)	13.5 (11.2-20.0)	616
Mexican Americans (2005 - 2006)	3.75 (3.56-3.95)	3.60 (3.42-3.81)	5.97 (5.53-6.48)	9.83 (9.19-10.4)	12.7 (11.3-14.5)	1972
Mexican Americans (2007 - 2008)	4.20 (3.96-4.46)	4.17 (3.81-4.58)	6.95 (6.33-7.73)	11.8 (10.4-12.3)	15.7 (14.4-17.6)	1505
Mexican Americans (2009 - 2010)	4.18 (3.73-4.69)	4.09 (3.68-4.53)	6.94 (5.71-7.74)	10.3 (8.91-13.3)	16.2 (11.9-19.8)	611
Non-Hispanic blacks (2001 - 2002)	2.66 (2.35-3.01)	2.66 (2.22-2.97)	4.24 (3.69-5.20)	7.18 (6.17-8.80)	11.0 (8.73-12.7)	680
Non-Hispanic blacks (2003 - 2004)	2.33 (2.11-2.57)	2.24 (2.02-2.47)	3.60 (3.22-4.13)	6.54 (4.91-8.47)	9.02 (6.84-11.8)	651
Non-Hispanic blacks (2005 - 2006)	2.50 (2.32-2.69)	2.40 (2.24-2.61)	3.97 (3.69-4.26)	6.71 (6.30-7.13)	9.41 (8.53-10.4)	2078
Non-Hispanic blacks (2007 - 2008)	2.89 (2.60-3.21)	2.76 (2.47-3.17)	4.92 (4.36-5.54)	8.63 (7.43-9.78)	11.8 (10.6-13.6)	1706
Non-Hispanic blacks (2009 - 2010)	2.40 (2.19-2.63)	2.35 (2.11-2.55)	3.81 (3.60-4.18)	6.31 (5.58-6.94)	8.31 (6.69-10.6)	543
Non-Hispanic whites (2001 - 2002)	3.95 (3.64-4.29)	3.73 (3.39-4.22)	6.19 (5.73-6.64)	10.0 (8.67-11.2)	13.3 (11.8-16.0)	1227
Non-Hispanic whites (2003 - 2004)	3.53 (3.16-3.94)	3.35 (3.01-3.68)	5.29 (4.81-5.96)	9.23 (7.61-11.0)	12.8 (11.0-16.5)	1091
Non-Hispanic whites (2005 - 2006)	3.63 (3.36-3.91)	3.51 (3.20-3.85)	5.60 (5.10-6.10)	8.58 (7.98-9.42)	11.8 (10.0-14.3)	3056
Non-Hispanic whites (2007 - 2008)	4.17 (3.83-4.54)	4.06 (3.71-4.52)	6.63 (6.18-7.23)	10.8 (9.86-11.8)	15.5 (14.0-16.8)	3190
Non-Hispanic whites (2009 - 2010)	3.82 (3.66-3.99)	3.67 (3.50-3.83)	5.98 (5.69-6.26)	9.40 (8.73-10.2)	12.9 (10.8-14.1)	1215

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Perchlorate_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Perchlorate_FactSheet.html

Urinary Perchlorate (creatinine corrected) (2011 – 2014)

CAS Number 14797-73-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	3.38 (3.17-3.60)	3.28 (2.99-3.60)	5.55 (5.21-5.92)	9.20 (8.31-10.1)	14.7 (11.1-17.4)	2465
Total population (2013 - 2014)	3.04 (2.80-3.30)	2.98 (2.76-3.24)	4.89 (4.56-5.37)	7.96 (7.25-8.67)	10.7 (9.68-12.4)	2643
Age 6-11 years (2011 - 2012)	5.56 (5.05-6.12)	5.25 (4.75-5.95)	8.57 (7.57-9.95)	14.3 (10.4-17.4)	18.0 (13.8-27.3)	393
Age 6-11 years (2013 - 2014)	5.06 (4.43-5.76)	4.83 (3.90-5.66)	7.71 (6.31-9.13)	11.0 (9.14-15.4)	15.4 (11.5-28.3)	398
Age 12-19 years (2011 - 2012)	2.70 (2.50-2.91)	2.87 (2.46-3.22)	3.92 (3.80-4.14)	5.73 (4.55-7.76)	8.14 (5.97-8.43)	384
Age 12-19 years (2013 - 2014)	2.59 (2.32-2.89)	2.41 (2.05-2.74)	4.06 (3.34-4.56)	6.33 (4.96-8.11)	8.66 (7.05-12.0)	449
Age 20+ years (2011 - 2012)	3.31 (3.07-3.56)	3.16 (2.85-3.54)	5.53 (5.16-5.88)	9.16 (8.03-10.2)	14.8 (10.1-18.8)	1688
Age 20+ years (2013 - 2014)	2.95 (2.72-3.20)	2.92 (2.72-3.19)	4.71 (4.45-5.21)	7.59 (6.77-8.35)	10.4 (9.02-11.7)	1796
Males (2011 - 2012)	3.12 (2.84-3.42)	2.99 (2.64-3.34)	4.84 (4.41-5.41)	8.38 (7.08-9.92)	14.7 (9.56-20.0)	1250
Males (2013 - 2014)	2.74 (2.51-2.99)	2.65 (2.32-2.91)	4.48 (4.00-4.81)	7.09 (6.32-8.25)	10.6 (8.16-13.1)	1312
Females (2011 - 2012)	3.64 (3.41-3.89)	3.61 (3.18-3.96)	6.10 (5.66-6.45)	9.86 (8.80-10.9)	14.7 (11.6-17.7)	1215
Females (2013 - 2014)	3.36 (3.08-3.67)	3.36 (3.06-3.60)	5.54 (4.86-5.92)	8.59 (7.75-9.45)	11.4 (10.0-13.1)	1331
Mexican Americans (2011 - 2012)	3.90 (3.21-4.75)	3.67 (3.17-4.42)	6.31 (5.16-7.92)	10.9 (8.38-14.4)	17.8 (11.7-28.1)	313
Mexican Americans (2013 - 2014)	3.46 (3.09-3.87)	3.24 (2.84-3.76)	5.57 (4.61-6.31)	9.16 (7.57-11.6)	12.4 (9.27-18.1)	451
Non-Hispanic blacks (2011 - 2012)	2.28 (2.10-2.46)	2.12 (1.99-2.31)	3.74 (3.20-4.03)	6.79 (5.15-8.44)	9.35 (7.57-12.2)	663
Non-Hispanic blacks (2013 - 2014)	2.10 (1.86-2.37)	1.92 (1.81-2.24)	3.39 (3.07-3.92)	5.42 (4.81-7.36)	9.21 (6.46-15.5)	574
Non-Hispanic whites (2011 - 2012)	3.58 (3.36-3.81)	3.50 (3.16-3.82)	5.72 (5.28-6.10)	9.22 (8.19-10.3)	14.8 (10.2-17.7)	808
Non-Hispanic whites (2013 - 2014)	3.17 (3.00-3.36)	3.13 (2.91-3.34)	4.94 (4.63-5.56)	7.88 (7.08-8.49)	10.4 (9.45-11.4)	975
All Hispanics (2011 - 2012)	3.52 (2.95-4.20)	3.31 (2.68-4.11)	5.83 (4.67-7.08)	9.91 (8.03-12.1)	15.2 (11.7-19.4)	566
All Hispanics (2013 - 2014)	3.17 (2.88-3.49)	3.01 (2.78-3.29)	5.11 (4.55-5.66)	8.41 (7.35-9.46)	12.3 (9.18-15.6)	699
Asians (2011 - 2012)	3.76 (3.41-4.15)	3.84 (3.45-4.12)	6.00 (5.25-7.04)	11.2 (8.22-18.8)	21.2 (12.6-33.6)	341
Asians (2013 - 2014)	3.79 (2.92-4.93)	3.84 (2.79-5.03)	6.42 (4.60-8.73)	10.8 (8.10-15.7)	17.9 (9.69-33.6)	291

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Perchlorate_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Perchlorate_FactSheet.html

Urinary Thiocyanate (2001 – 2010)

CAS Number 302-04-5

Geometric mean and selected percentiles of urine concentrations (in mg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	1.52 (1.44-1.61)	1.50 (1.40-1.60)	3.60 (3.00-4.10)	7.90 (6.90-9.00)	12.0 (10.0-13.0)	1617
Total population (2005 - 2006)	1.23 (1.12-1.35)	1.18 (1.08-1.31)	2.55 (2.31-2.83)	6.11 (5.10-6.85)	9.04 (8.14-9.93)	7697
Total population (2007 - 2008)	1.35 (1.26-1.45)	1.32 (1.23-1.42)	2.77 (2.47-3.13)	6.36 (5.39-7.33)	9.54 (8.58-11.1)	7629
Total population (2009 - 2010)	1.15 (1.08-1.24)	1.12 (1.04-1.18)	2.27 (2.11-2.45)	5.39 (4.61-6.37)	8.92 (7.59-9.83)	2844
Age 6-11 years (2001 - 2002)	1.35 (1.20-1.51)	1.50 (1.30-1.70)	2.50 (1.90-3.00)	3.70 (3.30-4.10)	4.90 (3.90-5.60)	374
Age 6-11 years (2005 - 2006)	.980 (.892-1.08)	1.03 (.916-1.15)	1.72 (1.55-1.92)	2.65 (2.31-3.09)	3.45 (2.96-4.21)	1054
Age 6-11 years (2007 - 2008)	1.10 (.989-1.22)	1.12 (1.02-1.24)	1.88 (1.68-2.07)	2.92 (2.48-3.52)	4.08 (3.35-5.30)	1143
Age 6-11 years (2009 - 2010)	.847 (.760-.945)	.855 (.762-1.02)	1.51 (1.31-1.82)	2.27 (2.00-2.45)	2.64 (2.30-3.09)	377
Age 12-19 years (2001 - 2002)	1.59 (1.43-1.77)	1.50 (1.40-1.70)	2.90 (2.50-3.30)	5.30 (4.30-7.40)	7.70 (5.90-10.0)	826
Age 12-19 years (2005 - 2006)	1.24 (1.11-1.39)	1.29 (1.15-1.47)	2.27 (1.99-2.62)	3.84 (3.18-4.65)	6.07 (4.76-6.95)	2106
Age 12-19 years (2007 - 2008)	1.29 (1.15-1.46)	1.35 (1.14-1.53)	2.39 (2.06-2.69)	3.93 (3.36-4.57)	6.14 (4.55-7.27)	1135
Age 12-19 years (2009 - 2010)	.978 (.869-1.10)	1.01 (.927-1.18)	1.76 (1.68-1.99)	2.96 (2.51-3.78)	4.48 (3.05-6.62)	452
Age 20+ years (2001 - 2002)	1.54 (1.43-1.65)	1.50 (1.40-1.60)	3.60 (3.00-4.10)	7.90 (6.90-9.00)	12.0 (10.0-13.0)	1617
Age 20+ years (2005 - 2006)	1.26 (1.14-1.40)	1.19 (1.08-1.34)	2.82 (2.50-3.15)	6.87 (6.06-7.58)	9.79 (8.78-10.7)	4537
Age 20+ years (2007 - 2008)	1.39 (1.29-1.50)	1.34 (1.25-1.46)	3.11 (2.68-3.57)	7.21 (6.05-8.31)	10.8 (8.99-12.0)	5351
Age 20+ years (2009 - 2010)	1.22 (1.13-1.32)	1.15 (1.07-1.23)	2.53 (2.31-2.93)	6.32 (5.11-7.59)	9.72 (8.62-11.4)	2015
Males (2001 - 2002)	1.86 (1.67-2.07)	1.80 (1.60-2.10)	4.00 (3.40-4.90)	8.40 (7.00-10.0)	12.0 (10.0-13.0)	1335
Males (2005 - 2006)	1.49 (1.36-1.64)	1.44 (1.27-1.62)	3.10 (2.82-3.56)	6.90 (6.13-7.64)	9.93 (8.99-10.7)	3765
Males (2007 - 2008)	1.61 (1.50-1.72)	1.60 (1.50-1.71)	3.32 (2.96-3.77)	7.27 (6.01-8.22)	10.9 (9.04-12.3)	3839
Males (2009 - 2010)	1.33 (1.22-1.46)	1.23 (1.15-1.36)	2.71 (2.29-3.10)	5.81 (5.01-7.19)	9.25 (7.85-10.0)	1401
Females (2001 - 2002)	1.26 (1.16-1.36)	1.30 (1.00-1.40)	2.50 (2.40-2.80)	6.00 (5.20-6.70)	8.70 (7.20-10.0)	1482
Females (2005 - 2006)	1.02 (.920-1.13)	.995 (.886-1.13)	2.07 (1.86-2.25)	4.61 (3.81-5.98)	8.04 (7.26-8.78)	3932
Females (2007 - 2008)	1.14 (1.04-1.24)	1.09 (.991-1.19)	2.31 (2.06-2.62)	5.51 (4.58-6.52)	8.59 (7.36-9.85)	3790
Females (2009 - 2010)	1.00 (.894-1.13)	.982 (.842-1.10)	1.95 (1.59-2.29)	4.63 (3.59-6.33)	8.79 (6.44-10.0)	1443
Mexican Americans (2001 - 2002)	1.14 (.977-1.33)	1.20 (.940-1.40)	2.20 (1.80-2.60)	3.90 (3.00-4.90)	5.70 (4.20-6.60)	707
Mexican Americans (2005 - 2006)	.823 (.744-.912)	.844 (.763-.937)	1.51 (1.36-1.71)	2.70 (2.26-3.22)	4.48 (3.49-5.40)	1972
Mexican Americans (2007 - 2008)	.993 (.926-1.06)	1.04 (.987-1.11)	1.88 (1.75-2.02)	3.30 (2.98-3.52)	4.56 (3.92-5.43)	1505
Mexican Americans (2009 - 2010)	.877 (.787-.977)	.917 (.800-1.02)	1.62 (1.34-1.92)	2.97 (2.57-3.83)	5.06 (4.06-5.56)	611
Non-Hispanic blacks (2001 - 2002)	1.91 (1.72-2.11)	2.00 (1.80-2.20)	3.90 (3.30-4.90)	7.60 (6.20-10.0)	10.0 (7.00-15.0)	679
Non-Hispanic blacks (2005 - 2006)	1.50 (1.32-1.72)	1.51 (1.36-1.68)	3.13 (2.56-3.81)	6.94 (5.66-8.09)	10.3 (8.01-12.4)	2078
Non-Hispanic blacks (2007 - 2008)	1.73 (1.61-1.86)	1.73 (1.61-1.86)	3.78 (3.53-4.23)	8.29 (7.25-9.07)	12.8 (11.2-14.5)	1707
Non-Hispanic blacks (2009 - 2010)	1.34 (1.21-1.48)	1.29 (1.15-1.49)	2.67 (2.36-3.32)	6.82 (6.01-8.08)	12.1 (7.67-14.1)	544
Non-Hispanic whites (2001 - 2002)	1.56 (1.45-1.68)	1.50 (1.40-1.70)	3.40 (2.80-3.80)	7.20 (6.30-8.50)	12.0 (8.90-13.0)	1228
Non-Hispanic whites (2005 - 2006)	1.30 (1.18-1.44)	1.25 (1.12-1.40)	2.74 (2.46-3.01)	6.53 (5.57-7.31)	9.43 (8.58-10.4)	3056
Non-Hispanic whites (2007 - 2008)	1.42 (1.29-1.56)	1.41 (1.28-1.53)	2.98 (2.52-3.44)	6.67 (5.24-8.14)	9.71 (8.32-11.9)	3190
Non-Hispanic whites (2009 - 2010)	1.27 (1.18-1.36)	1.18 (1.13-1.26)	2.44 (2.27-2.72)	5.95 (4.62-7.69)	9.59 (8.53-11.3)	1215

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 05-06, 07-08, and 09-10 are 0.02, 0.02, 0.02, and 0.02 respectively.

Urinary Thiocyanate (2011 – 2014)

CAS Number 302-04-5

Geometric mean and selected percentiles of urine concentrations (in mg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.09 (1.01-1.17)	1.05 (.973-1.17)	2.23 (2.04-2.43)	4.69 (4.03-5.64)	7.16 (5.66-8.20)	2467
Total population (2013 - 2014)	1.04 (.963-1.13)	1.00 (.884-1.12)	2.10 (1.84-2.40)	4.75 (3.82-5.42)	7.90 (6.56-8.66)	2643
Age 6-11 years (2011 - 2012)	.897 (.816-.987)	.982 (.847-1.11)	1.54 (1.35-1.74)	2.23 (1.93-3.02)	3.03 (2.34-4.45)	394
Age 6-11 years (2013 - 2014)	.906 (.777-1.06)	.972 (.779-1.17)	1.57 (1.34-1.88)	2.44 (2.08-2.89)	3.31 (2.26-4.85)	398
Age 12-19 years (2011 - 2012)	.983 (.802-1.21)	.954 (.788-1.13)	1.73 (1.31-2.42)	3.48 (2.44-5.01)	5.86 (3.48-8.47)	384
Age 12-19 years (2013 - 2014)	1.01 (.875-1.18)	.981 (.837-1.21)	1.86 (1.49-2.41)	3.20 (2.48-4.79)	5.37 (3.28-7.96)	449
Age 20+ years (2011 - 2012)	1.13 (1.05-1.21)	1.10 (1.01-1.21)	2.42 (2.18-2.86)	5.35 (4.36-6.21)	7.38 (6.43-8.45)	1689
Age 20+ years (2013 - 2014)	1.06 (.972-1.16)	1.00 (.877-1.13)	2.26 (1.95-2.62)	5.17 (4.44-5.93)	8.38 (7.16-9.76)	1796
Males (2011 - 2012)	1.27 (1.18-1.38)	1.24 (1.10-1.37)	2.43 (2.11-2.97)	4.91 (3.99-6.43)	7.30 (5.96-8.51)	1251
Males (2013 - 2014)	1.16 (1.07-1.26)	1.13 (.991-1.26)	2.35 (2.00-2.74)	4.93 (4.33-5.80)	8.12 (6.35-10.8)	1313
Females (2011 - 2012)	.931 (.815-1.07)	.924 (.797-1.07)	1.95 (1.61-2.27)	4.36 (3.63-5.37)	6.83 (5.51-8.20)	1216
Females (2013 - 2014)	.938 (.849-1.04)	.903 (.771-1.04)	1.81 (1.53-2.10)	4.30 (3.40-5.36)	7.43 (5.52-8.43)	1330
Mexican Americans (2011 - 2012)	.892 (.730-1.09)	.936 (.734-1.16)	1.66 (1.38-1.94)	3.03 (1.90-4.79)	4.24 (2.64-5.25)	313
Mexican Americans (2013 - 2014)	.824 (.719-.944)	.877 (.749-.992)	1.51 (1.29-1.87)	2.51 (2.31-3.21)	3.96 (2.51-6.35)	451
Non-Hispanic blacks (2011 - 2012)	1.29 (1.12-1.48)	1.25 (1.14-1.40)	2.37 (2.01-2.92)	5.75 (4.50-7.28)	9.91 (7.40-12.7)	663
Non-Hispanic blacks (2013 - 2014)	1.58 (1.42-1.76)	1.37 (1.30-1.54)	3.33 (2.81-3.93)	8.53 (6.12-9.87)	14.1 (9.87-15.2)	574
Non-Hispanic whites (2011 - 2012)	1.16 (1.06-1.26)	1.12 (.996-1.28)	2.43 (2.16-2.92)	5.11 (4.03-6.43)	7.30 (5.87-8.45)	810
Non-Hispanic whites (2013 - 2014)	1.06 (.949-1.19)	1.02 (.861-1.19)	2.20 (1.78-2.67)	4.53 (3.60-5.61)	7.91 (6.16-8.89)	975
All Hispanics (2011 - 2012)	.865 (.733-1.02)	.876 (.734-1.02)	1.57 (1.38-1.82)	3.42 (2.20-4.37)	4.84 (3.85-6.40)	566
All Hispanics (2013 - 2014)	.849 (.753-.957)	.891 (.757-.993)	1.51 (1.31-1.84)	2.93 (2.32-4.55)	5.32 (3.09-6.84)	699
Asians (2011 - 2012)	.646 (.571-.731)	.715 (.624-.765)	1.19 (1.02-1.47)	2.51 (1.82-2.71)	3.19 (2.61-4.11)	341
Asians (2013 - 2014)	.555 (.478-.644)	.567 (.503-.640)	.983 (.817-1.20)	1.99 (1.47-2.37)	3.17 (2.12-4.08)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.02 and 0.02, respectively.

Urinary Thiocyanate (creatinine corrected) (2001 – 2010)

CAS Number 302-04-5

Geometric mean and selected percentiles of urine concentrations (in mg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	1.53 (1.43-1.64)	1.47 (1.37-1.61)	3.35 (2.95-3.74)	7.34 (6.67-7.81)	10.3 (8.81-11.3)	1616
Total population (2005 - 2006)	1.23 (1.13-1.33)	1.15 (1.05-1.27)	2.44 (2.18-2.68)	5.67 (5.16-6.28)	8.23 (7.71-8.98)	7697
Total population (2007 - 2008)	1.39 (1.28-1.51)	1.33 (1.22-1.43)	2.72 (2.42-3.04)	6.11 (5.25-7.30)	9.59 (8.03-11.5)	7628
Total population (2009 - 2010)	1.24 (1.15-1.34)	1.13 (1.04-1.21)	2.31 (2.11-2.58)	5.78 (4.64-6.63)	9.13 (7.28-11.2)	2843
Age 6-11 years (2001 - 2002)	1.56 (1.35-1.80)	1.55 (1.35-1.82)	2.67 (2.33-3.13)	4.46 (3.79-5.20)	5.33 (4.58-6.16)	374
Age 6-11 years (2005 - 2006)	1.16 (1.06-1.28)	1.18 (1.06-1.34)	2.03 (1.81-2.32)	3.15 (2.83-3.43)	4.25 (3.49-4.58)	1054
Age 6-11 years (2007 - 2008)	1.40 (1.27-1.54)	1.42 (1.24-1.59)	2.28 (2.02-2.53)	3.74 (3.29-4.26)	5.23 (4.39-6.65)	1143
Age 6-11 years (2009 - 2010)	1.16 (1.04-1.30)	1.12 (1.02-1.23)	1.90 (1.58-2.26)	2.96 (2.47-3.57)	3.92 (3.04-4.67)	376
Age 12-19 years (2001 - 2002)	1.23 (1.12-1.35)	1.14 (1.08-1.24)	2.12 (1.78-2.45)	3.88 (3.28-4.91)	5.75 (3.93-8.13)	825
Age 12-19 years (2005 - 2006)	.941 (.867-1.02)	.937 (.855-1.03)	1.69 (1.51-1.86)	2.95 (2.43-3.64)	4.15 (3.64-5.00)	2106
Age 12-19 years (2007 - 2008)	1.01 (.910-1.12)	1.04 (.906-1.17)	1.75 (1.60-1.92)	2.94 (2.49-3.54)	4.69 (3.64-5.44)	1134
Age 12-19 years (2009 - 2010)	.917 (.858-.980)	.875 (.784-.972)	1.53 (1.36-1.79)	2.90 (2.26-3.84)	4.86 (3.49-5.10)	452
Age 20+ years (2001 - 2002)	1.59 (1.47-1.71)	1.47 (1.37-1.61)	3.35 (2.95-3.74)	7.34 (6.67-7.81)	10.3 (8.81-11.3)	1616
Age 20+ years (2005 - 2006)	1.29 (1.17-1.42)	1.20 (1.08-1.33)	2.68 (2.37-3.10)	6.43 (5.88-7.07)	8.99 (8.23-10.2)	4537
Age 20+ years (2007 - 2008)	1.46 (1.34-1.59)	1.37 (1.27-1.47)	3.00 (2.69-3.45)	7.02 (5.82-8.26)	10.5 (8.63-12.9)	5351
Age 20+ years (2009 - 2010)	1.30 (1.19-1.43)	1.17 (1.08-1.26)	2.63 (2.31-3.05)	6.41 (5.42-7.83)	9.88 (8.30-12.1)	2015
Males (2001 - 2002)	1.51 (1.37-1.67)	1.42 (1.31-1.59)	3.33 (3.00-3.67)	6.38 (5.81-6.92)	8.51 (7.41-9.72)	1335
Males (2005 - 2006)	1.24 (1.12-1.37)	1.18 (1.05-1.32)	2.61 (2.26-3.01)	5.67 (5.00-6.43)	8.17 (7.15-9.13)	3765
Males (2007 - 2008)	1.38 (1.28-1.50)	1.32 (1.23-1.42)	2.77 (2.42-3.08)	6.13 (5.47-6.97)	9.27 (7.82-11.1)	3839
Males (2009 - 2010)	1.22 (1.09-1.36)	1.12 (1.02-1.24)	2.47 (2.14-2.96)	5.78 (4.51-6.67)	8.72 (6.88-11.3)	1400
Females (2001 - 2002)	1.55 (1.43-1.69)	1.45 (1.33-1.58)	2.79 (2.42-3.25)	7.07 (5.86-7.69)	10.0 (8.18-11.1)	1480
Females (2005 - 2006)	1.22 (1.12-1.33)	1.13 (1.04-1.24)	2.27 (2.00-2.54)	5.62 (4.91-6.37)	8.40 (7.20-10.5)	3932
Females (2007 - 2008)	1.40 (1.27-1.55)	1.34 (1.19-1.45)	2.69 (2.40-3.03)	6.07 (4.89-7.80)	9.88 (7.93-12.1)	3789
Females (2009 - 2010)	1.26 (1.12-1.42)	1.14 (1.01-1.26)	2.15 (1.88-2.74)	5.80 (4.17-7.29)	9.24 (6.88-12.0)	1443
Mexican Americans (2001 - 2002)	1.07 (.898-1.27)	1.06 (.819-1.29)	1.97 (1.51-2.50)	3.62 (2.86-4.52)	5.10 (3.52-7.33)	707
Mexican Americans (2005 - 2006)	.768 (.685-.861)	.773 (.684-.881)	1.37 (1.20-1.59)	2.44 (2.19-2.85)	3.66 (3.28-4.27)	1972
Mexican Americans (2007 - 2008)	.995 (.923-1.07)	1.03 (.918-1.14)	1.88 (1.71-2.05)	3.27 (2.77-3.76)	4.59 (3.86-5.59)	1505
Mexican Americans (2009 - 2010)	.921 (.845-1.01)	.912 (.849-.985)	1.57 (1.38-1.90)	3.09 (2.79-3.63)	4.24 (3.72-5.62)	611
Non-Hispanic blacks (2001 - 2002)	1.37 (1.18-1.59)	1.37 (1.18-1.61)	2.80 (2.21-3.43)	5.67 (4.17-6.74)	7.64 (5.91-11.3)	678
Non-Hispanic blacks (2005 - 2006)	1.08 (.972-1.20)	1.05 (.972-1.16)	2.15 (1.84-2.57)	4.77 (3.93-5.61)	6.91 (5.84-7.80)	2078
Non-Hispanic blacks (2007 - 2008)	1.31 (1.21-1.41)	1.25 (1.18-1.36)	2.81 (2.55-3.24)	6.19 (5.29-6.77)	8.74 (7.44-9.59)	1706
Non-Hispanic blacks (2009 - 2010)	1.07 (.963-1.19)	.993 (.888-1.08)	2.14 (1.87-2.49)	5.39 (3.94-6.76)	7.74 (6.56-11.3)	543
Non-Hispanic whites (2001 - 2002)	1.67 (1.55-1.80)	1.55 (1.42-1.73)	3.29 (3.00-3.73)	7.09 (6.38-7.95)	10.3 (8.78-11.1)	1227
Non-Hispanic whites (2005 - 2006)	1.38 (1.25-1.52)	1.30 (1.14-1.44)	2.78 (2.48-3.12)	6.31 (5.67-7.08)	9.00 (8.13-10.5)	3056
Non-Hispanic whites (2007 - 2008)	1.55 (1.40-1.70)	1.45 (1.32-1.58)	2.96 (2.56-3.53)	7.03 (5.71-8.56)	10.9 (8.70-13.1)	3190
Non-Hispanic whites (2009 - 2010)	1.42 (1.32-1.54)	1.25 (1.17-1.38)	2.71 (2.38-3.17)	6.59 (5.61-7.85)	10.2 (8.62-11.8)	1215

Urinary Thiocyanate (creatinine corrected) (2011 – 2014)

CAS Number 302-04-5

Geometric mean and selected percentiles of urine concentrations (in mg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.24 (1.18-1.31)	1.19 (1.11-1.28)	2.20 (2.12-2.37)	5.10 (4.05-5.98)	8.53 (6.73-10.9)	2465
Total population (2013 - 2014)	1.21 (1.13-1.29)	1.15 (1.06-1.23)	2.19 (1.96-2.53)	4.66 (4.14-5.35)	8.07 (7.12-9.33)	2642
Age 6-11 years (2011 - 2012)	1.28 (1.16-1.40)	1.27 (1.12-1.39)	2.11 (1.89-2.34)	3.11 (2.69-4.13)	4.73 (3.62-5.77)	393
Age 6-11 years (2013 - 2014)	1.36 (1.18-1.57)	1.41 (1.19-1.62)	2.34 (1.92-2.62)	3.39 (2.69-4.29)	5.02 (3.23-7.47)	398
Age 12-19 years (2011 - 2012)	.958 (.831-1.10)	.949 (.803-1.19)	1.49 (1.35-1.89)	2.82 (2.12-3.30)	3.77 (2.97-4.91)	384
Age 12-19 years (2013 - 2014)	.919 (.810-1.04)	.926 (.721-1.06)	1.45 (1.28-1.64)	2.70 (2.33-3.40)	4.33 (2.71-8.41)	449
Age 20+ years (2011 - 2012)	1.29 (1.22-1.35)	1.21 (1.12-1.31)	2.41 (2.19-2.67)	5.70 (4.69-7.11)	9.90 (7.75-11.3)	1688
Age 20+ years (2013 - 2014)	1.24 (1.15-1.34)	1.17 (1.08-1.27)	2.31 (2.03-2.75)	5.11 (4.54-6.09)	8.83 (7.82-10.2)	1795
Males (2011 - 2012)	1.20 (1.11-1.29)	1.16 (1.06-1.28)	2.16 (2.07-2.48)	5.00 (3.77-6.42)	7.75 (6.10-10.4)	1250
Males (2013 - 2014)	1.17 (1.09-1.25)	1.14 (1.03-1.24)	2.10 (1.92-2.49)	5.08 (4.41-5.70)	8.07 (6.68-9.68)	1312
Females (2011 - 2012)	1.28 (1.17-1.40)	1.22 (1.11-1.38)	2.20 (2.01-2.59)	5.10 (3.89-6.02)	10.4 (6.32-14.0)	1215
Females (2013 - 2014)	1.25 (1.14-1.38)	1.16 (1.06-1.25)	2.23 (1.89-2.60)	4.36 (3.83-5.14)	7.86 (6.32-9.96)	1330
Mexican Americans (2011 - 2012)	1.01 (.831-1.22)	.935 (.790-1.20)	1.90 (1.45-2.32)	3.28 (2.53-3.73)	4.49 (3.46-6.12)	313
Mexican Americans (2013 - 2014)	.943 (.828-1.07)	.917 (.853-1.03)	1.58 (1.27-1.87)	2.94 (2.27-3.92)	4.62 (3.15-5.41)	451
Non-Hispanic blacks (2011 - 2012)	1.00 (.901-1.12)	.958 (.892-1.04)	1.96 (1.71-2.23)	3.72 (3.31-4.55)	6.36 (4.89-7.76)	663
Non-Hispanic blacks (2013 - 2014)	1.21 (1.07-1.36)	1.04 (.979-1.19)	2.26 (2.01-3.17)	6.42 (5.00-7.69)	9.44 (7.73-10.7)	574
Non-Hispanic whites (2011 - 2012)	1.41 (1.31-1.52)	1.35 (1.23-1.46)	2.66 (2.21-2.91)	5.78 (4.49-7.41)	10.4 (7.41-12.8)	808
Non-Hispanic whites (2013 - 2014)	1.31 (1.20-1.43)	1.27 (1.17-1.38)	2.43 (2.03-2.86)	4.88 (4.20-6.30)	8.53 (7.38-10.4)	974
All Hispanics (2011 - 2012)	.968 (.826-1.13)	.923 (.805-1.11)	1.76 (1.45-2.07)	3.26 (2.53-3.76)	5.10 (3.76-6.40)	566
All Hispanics (2013 - 2014)	.949 (.836-1.08)	.913 (.829-1.03)	1.64 (1.34-1.89)	3.11 (2.34-4.24)	4.98 (3.12-8.34)	699
Asians (2011 - 2012)	.864 (.775-.964)	.868 (.767-.993)	1.44 (1.30-1.63)	2.31 (1.96-2.81)	3.69 (2.60-5.35)	341
Asians (2013 - 2014)	.870 (.761-.995)	.828 (.749-.933)	1.47 (1.29-1.82)	3.12 (1.99-3.61)	3.77 (2.99-4.62)	291

Serum Perfluorobutane sulfonic acid (PFBS) (2003 – 2010)

CAS Number 375-73-5

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2094
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	.100 (<LOD-.200)	2120
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2100
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2233
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	640
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	.100 (<LOD-.100)	640
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	357
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	364
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1454
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	.100 (<LOD-.200)	1480
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1743
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1869
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1053
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	.100 (<LOD-.200)	1048
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1059
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1075
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1041
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	.100 (<LOD-.200)	1072
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1041
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.4, 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorobutane sulfonic acid (PFBS) (2003 – 2010)

CAS Number 375-73-5

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	485
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	.100 (<LOD-.200)	499
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	391
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	461
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	538
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	.100 (<LOD-.100)	544
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	419
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	391
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	962
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	.100 (<LOD-.400)	935
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	931
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.4, 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorobutane sulfonic acid (PFBS) (2011 – 2014)‡

CAS Number 375-73-5

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1904
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2168
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	344
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	402
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1560
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1766
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	966
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1032
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	938
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1136
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	211
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	332
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	485
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	455
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	666
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	862
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	406
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	537
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	291
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	236

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.1 and 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2013-2014.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorobutane sulfonic acid (PFBS) (2013 – 2014)

CAS Number 375-73-5

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	639
Age 3-5 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	181
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.130 (<LOD-.140)	458
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	.130 (<LOD-.130)	343
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	296
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	220
Other (2013 - 2014)	*	< LOD	< LOD	< LOD	.130 (<LOD-.140)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorodecanoic acid (PFDA) (1999 – 2010)

CAS Number 335-76-2

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	.200 (<LOD-.300)	.400 (.300-.700)	.600 (.400-1.10)	1562
Total population (2003 - 2004)	*	< LOD	.300 (<LOD-.500)	.600 (.400-1.10)	.900 (.500-1.80)	2094
Total population (2005 - 2006)	.355 (.297-.423)	.300 (.300-.400)	.500 (.400-.700)	.900 (.600-1.60)	1.50 (.900-2.60)	2120
Total population (2007 - 2008)	.286 (.264-.309)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.700)	.900 (.800-1.00)	2100
Total population (2009 - 2010)	.279 (.258-.303)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.800)	.900 (.800-1.10)	2233
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	.300 (.200-.400)	.400 (.300-.600)	543
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	.500 (<LOD-1.00)	.800 (.300-1.20)	640
Age 12-19 years (2005 - 2006)	.295 (.258-.338)	.300 (.200-.300)	.500 (.400-.500)	.600 (.500-.800)	.800 (.600-1.60)	640
Age 12-19 years (2007 - 2008)	.231 (.214-.248)	.200 (.200-.300)	.300 (.300-.400)	.500 (.400-.500)	.600 (.500-.700)	357
Age 12-19 years (2009 - 2010)	.220 (.198-.245)	.200 (.200-.200)	.300 (.300-.300)	.400 (.400-.600)	.600 (.400-.800)	364
Age 20+ years (1999 - 2000)	*	< LOD	.300 (.200-.300)	.400 (.300-.800)	.600 (.400-1.50)	1019
Age 20+ years (2003 - 2004)	*	< LOD	.400 (<LOD-.500)	.700 (.400-1.00)	.900 (.500-1.80)	1454
Age 20+ years (2005 - 2006)	.364 (.303-.438)	.300 (.300-.400)	.500 (.400-.700)	1.00 (.600-1.70)	1.50 (.900-2.60)	1480
Age 20+ years (2007 - 2008)	.295 (.271-.321)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.800)	.900 (.800-1.10)	1743
Age 20+ years (2009 - 2010)	.289 (.265-.314)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.800)	.900 (.800-1.20)	1869
Males (1999 - 2000)	*	< LOD	.300 (.200-.300)	.400 (.300-.700)	.500 (.300-1.90)	743
Males (2003 - 2004)	*	< LOD	.400 (<LOD-.500)	.800 (.400-1.40)	1.10 (.600-2.10)	1053
Males (2005 - 2006)	.381 (.318-.456)	.400 (.300-.400)	.600 (.400-.800)	1.00 (.600-2.20)	1.70 (1.00-2.60)	1048
Males (2007 - 2008)	.306 (.283-.331)	.300 (.300-.300)	.400 (.400-.500)	.700 (.600-.800)	.900 (.800-1.20)	1059
Males (2009 - 2010)	.289 (.264-.318)	.300 (.300-.300)	.400 (.400-.500)	.600 (.500-.800)	.800 (.600-1.20)	1075
Females (1999 - 2000)	*	< LOD	.200 (<LOD-.300)	.400 (.300-.800)	.600 (.400-1.40)	819
Females (2003 - 2004)	*	< LOD	.300 (<LOD-.400)	.500 (.400-.800)	.800 (.500-1.20)	1041
Females (2005 - 2006)	.331 (.277-.396)	.300 (.300-.400)	.500 (.400-.600)	.900 (.600-1.40)	1.30 (.800-2.30)	1072
Females (2007 - 2008)	.267 (.245-.292)	.300 (.200-.300)	.400 (.400-.500)	.600 (.500-.800)	.800 (.700-1.10)	1041
Females (2009 - 2010)	.270 (.248-.295)	.300 (.200-.300)	.400 (.400-.500)	.700 (.600-.800)	1.00 (.800-1.10)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.3, 0.2, 0.2, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorodecanoic acid (PFDA) (1999 – 2010)

CAS Number 335-76-2

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	.300 (<LOD-.300)	.300 (.200-1.50)	584
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.500 (.400-.500)	.600 (.500-.800)	485
Mexican Americans (2005 - 2006)	.283 (.245-.327)	.300 (.200-.300)	.400 (.300-.500)	.600 (.500-1.00)	1.00 (.500-2.40)	499
Mexican Americans (2007 - 2008)	.253 (.222-.289)	.200 (.200-.300)	.400 (.300-.500)	.600 (.400-.700)	.600 (.500-1.40)	391
Mexican Americans (2009 - 2010)	.242 (.215-.272)	.200 (.200-.300)	.400 (.300-.400)	.500 (.500-.600)	.700 (.600-.800)	461
Non-Hispanic blacks (1999 - 2000)	*	.200 (<LOD-.300)	.400 (.200-.700)	.800 (.500-1.20)	1.10 (.600-2.30)	303
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.400 (<LOD-.700)	.800 (.400-1.50)	1.00 (.500-3.10)	538
Non-Hispanic blacks (2005 - 2006)	.405 (.309-.531)	.400 (.300-.500)	.600 (.400-.900)	1.20 (.600-2.90)	2.30 (1.10-3.70)	544
Non-Hispanic blacks (2007 - 2008)	.331 (.298-.368)	.300 (.300-.400)	.500 (.400-.600)	.800 (.600-.900)	1.00 (.800-1.50)	419
Non-Hispanic blacks (2009 - 2010)	.336 (.298-.379)	.300 (.300-.300)	.500 (.400-.600)	.800 (.600-1.00)	1.10 (.800-2.60)	391
Non-Hispanic whites (1999 - 2000)	*	< LOD	.300 (<LOD-.300)	.400 (.300-.600)	.500 (.400-.800)	519
Non-Hispanic whites (2003 - 2004)	*	< LOD	.300 (<LOD-.500)	.600 (.400-1.00)	.900 (.500-1.80)	962
Non-Hispanic whites (2005 - 2006)	.350 (.294-.417)	.300 (.300-.400)	.500 (.400-.700)	.900 (.600-1.50)	1.40 (.800-2.30)	935
Non-Hispanic whites (2007 - 2008)	.276 (.254-.301)	.300 (.200-.300)	.400 (.400-.500)	.600 (.500-.700)	.900 (.700-.900)	931
Non-Hispanic whites (2009 - 2010)	.270 (.240-.304)	.300 (.200-.300)	.400 (.300-.500)	.600 (.500-.800)	.800 (.600-1.10)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.3, 0.2, 0.2, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorodecanoic acid (PFDA) (2011 – 2016)

CAS Number 335-76-2

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.199 (.181-.220)	.190 (.170-.210)	.300 (.270-.340)	.480 (.420-.580)	.690 (.600-.770)	1904
Total population (2013 - 2014)	.185 (.165-.208)	.200 (.200-.200)	.300 (.300-.300)	.500 (.400-.600)	.700 (.600-.900)	2168
Total population (2015 - 2016)	.154 (.140-.169)	.100 (.100-.200)	.300 (.200-.300)	.400 (.400-.600)	.700 (.500-.900)	1993
Age 12-19 years (2011 - 2012)	.146 (.126-.168)	.150 (.120-.170)	.200 (.180-.230)	.290 (.240-.340)	.360 (.290-.560)	344
Age 12-19 years (2013 - 2014)	.136 (.122-.152)	.100 (.100-.200)	.200 (.200-.200)	.300 (.200-.400)	.400 (.300-.500)	402
Age 12-19 years (2015 - 2016)	*	.100 (<LOD-.100)	.200 (.100-.200)	.200 (.200-.400)	.300 (.200-.500)	353
Age 20+ years (2011 - 2012)	.209 (.189-.230)	.200 (.180-.230)	.320 (.280-.370)	.510 (.440-.590)	.730 (.630-.850)	1560
Age 20+ years (2013 - 2014)	.193 (.171-.218)	.200 (.200-.200)	.300 (.300-.400)	.500 (.400-.600)	.800 (.600-.900)	1766
Age 20+ years (2015 - 2016)	.160 (.144-.178)	.200 (.100-.200)	.300 (.200-.300)	.400 (.400-.600)	.700 (.500-1.00)	1640
Males (2011 - 2012)	.206 (.184-.232)	.200 (.180-.230)	.310 (.260-.370)	.440 (.380-.550)	.620 (.480-.810)	966
Males (2013 - 2014)	.198 (.175-.225)	.200 (.200-.200)	.300 (.300-.400)	.500 (.400-.700)	.800 (.600-1.00)	1032
Males (2015 - 2016)	.153 (.137-.172)	.100 (.100-.200)	.300 (.200-.300)	.400 (.300-.600)	.700 (.400-1.00)	964
Females (2011 - 2012)	.193 (.177-.211)	.190 (.170-.210)	.290 (.260-.340)	.530 (.410-.640)	.690 (.640-.830)	938
Females (2013 - 2014)	.174 (.155-.195)	.200 (.100-.200)	.300 (.200-.300)	.500 (.400-.500)	.700 (.500-.900)	1136
Females (2015 - 2016)	.154 (.141-.168)	.100 (.100-.200)	.200 (.200-.300)	.400 (.400-.600)	.800 (.500-1.10)	1029
Mexican Americans (2011 - 2012)	.176 (.150-.205)	.170 (.150-.200)	.260 (.210-.300)	.380 (.300-.530)	.530 (.360-.600)	211
Mexican Americans (2013 - 2014)	.145 (.125-.169)	.100 (.100-.200)	.200 (.200-.300)	.300 (.200-.500)	.400 (.300-1.40)	332
Mexican Americans (2015 - 2016)	.124 (.111-.138)	.100 (<LOD-.100)	.200 (.200-.200)	.300 (.200-.300)	.400 (.300-.800)	370
Non-Hispanic blacks (2011 - 2012)	.214 (.193-.237)	.200 (.180-.220)	.330 (.280-.380)	.590 (.420-.850)	.880 (.670-1.06)	485
Non-Hispanic blacks (2013 - 2014)	.200 (.162-.246)	.200 (.200-.200)	.300 (.200-.500)	.600 (.400-.900)	.900 (.700-1.20)	455
Non-Hispanic blacks (2015 - 2016)	.155 (.140-.171)	.100 (.100-.200)	.300 (.200-.300)	.500 (.400-.500)	.800 (.500-1.10)	439
Non-Hispanic whites (2011 - 2012)	.193 (.171-.219)	.190 (.170-.220)	.290 (.260-.340)	.440 (.360-.590)	.620 (.480-.740)	666
Non-Hispanic whites (2013 - 2014)	.184 (.158-.213)	.200 (.200-.200)	.300 (.200-.400)	.500 (.400-.500)	.700 (.500-.800)	862
Non-Hispanic whites (2015 - 2016)	.150 (.136-.166)	.100 (.100-.200)	.200 (.200-.300)	.400 (.300-.500)	.600 (.400-.700)	619
All Hispanics (2011 - 2012)	.182 (.156-.212)	.170 (.150-.200)	.270 (.210-.330)	.430 (.330-.530)	.540 (.440-.760)	406
All Hispanics (2013 - 2014)	.150 (.135-.167)	.200 (.100-.200)	.200 (.200-.300)	.300 (.300-.400)	.400 (.300-1.00)	537
All Hispanics (2015 - 2016)	*	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.300-.400)	.500 (.400-.600)	629
Asians (2011 - 2012)	.367 (.308-.438)	.350 (.280-.420)	.670 (.510-.870)	1.35 (.870-2.05)	2.05 (1.19-2.52)	291
Asians (2013 - 2014)	.360 (.294-.439)	.400 (.300-.500)	.700 (.500-.900)	1.50 (1.00-2.10)	2.20 (1.60-3.30)	236
Asians (2015 - 2016)	.308 (.254-.373)	.300 (.200-.400)	.700 (.400-.900)	1.30 (.800-1.90)	2.10 (1.00-4.60)	220

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorodecanoic acid (PFDA) (2013 – 2014)

CAS Number 335-76-2

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	.170 (.140-.220)	.300 (.240-.340)	.370 (.300-.420)	639
Age 3-5 years (2013 - 2014)	*	.100 (<LOD-.130)	.170 (.130-.270)	.340 (.190-.440)	.370 (.230-.930)	181
Age 6-11 years (2013 - 2014)	*	< LOD	.180 (.160-.200)	.290 (.240-.320)	.350 (.310-.390)	458
Males (2013 - 2014)	*	< LOD	.170 (.120-.230)	.300 (.230-.340)	.370 (.260-.460)	343
Females (2013 - 2014)	*	.100 (<LOD-.110)	.180 (.160-.230)	.290 (.240-.350)	.380 (.280-.470)	296
All Hispanics (2013 - 2014)	*	< LOD	.170 (.140-.210)	.270 (.230-.340)	.400 (.270-.420)	220
Other (2013 - 2014)	*	< LOD	.170 (.130-.230)	.300 (.240-.350)	.370 (.290-.460)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorododecanoic acid (PFDoA) (1999 – 2010)

CAS Number 307-55-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1562
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2094
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2120
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2100
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2233
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	543
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	640
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	640
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	357
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	364
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1019
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1454
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1480
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1743
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	.100 (<LOD-.100)	1869
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	743
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1053
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1048
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1059
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1075
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	819
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1041
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1072
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1041
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	.100 (<LOD-.100)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 1.0, 0.2, 0.2, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorododecanoic acid (PFDoA) (1999 – 2010)

CAS Number 307-55-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	584
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	485
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	499
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	391
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	461
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	303
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	538
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	544
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	419
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	.100 (<LOD-.400)	391
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	519
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	962
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	935
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	931
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 1.0, 0.2, 0.2, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorododecanoic acid (PFDoA) (2011 – 2016)

CAS Number 307-55-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	.140 (<LOD-.240)	1904
Total population (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.300)	2168
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1993
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	344
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (<LOD-.300)	402
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	353
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	.150 (<LOD-.280)	1560
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.300)	1766
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1640
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	.140 (<LOD-.240)	966
Males (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.300)	1032
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	964
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	.130 (<LOD-.280)	938
Females (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.300)	1136
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1029
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	.110 (<LOD-.230)	211
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.200 (<LOD-.300)	.300 (.200-.300)	332
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	370
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	.110 (<LOD-.160)	485
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.300)	455
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	439
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	.130 (<LOD-.290)	666
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (<LOD-.300)	862
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	619
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	.110 (<LOD-.150)	406
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.200 (.100-.300)	.300 (.200-.300)	537
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	629
Asians (2011 - 2012)	*	< LOD	< LOD	.180 (.130-.350)	.360 (.180-.440)	291
Asians (2013 - 2014)	*	< LOD	.100 (<LOD-.200)	.200 (.200-.500)	.300 (.200-.500)	236
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	220

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorododecanoic acid (PFDoDA) (2013 – 2014)

CAS Number 307-55-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	639
Age 3-5 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	181
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	458
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	343
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	296
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	220
Other (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluoroheptanoic acid (PFHpA) (1999 – 2010)

CAS Number 375-85-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	.500 (<LOD-.600)	.700 (.500-1.00)	1562
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.400 (<LOD-.500)	2094
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	.700 (<LOD-1.70)	2120
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	.500 (.400-.600)	2100
Total population (2009 - 2010)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.300)	2233
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	.800 (.600-1.10)	1.20 (.800-1.80)	543
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	.400 (<LOD-.600)	.600 (.500-.900)	640
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.700 (<LOD-1.10)	1.10 (.600-2.70)	640
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.500 (<LOD-.600)	.600 (.500-.700)	357
Age 12-19 years (2009 - 2010)	*	< LOD	.100 (.100-.200)	.200 (.200-.400)	.400 (.200-.500)	364
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	.600 (<LOD-.900)	1019
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1454
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	.600 (<LOD-2.10)	1480
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	.500 (<LOD-.500)	1743
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	.100 (.100-.200)	.200 (.200-.200)	1869
Males (1999 - 2000)	*	< LOD	< LOD	.500 (<LOD-.600)	.700 (.500-1.00)	743
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	.300 (<LOD-.400)	1053
Males (2005 - 2006)	*	< LOD	< LOD	.400 (<LOD-1.00)	.800 (<LOD-2.10)	1048
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	.600 (.400-.700)	1059
Males (2009 - 2010)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.300)	1075
Females (1999 - 2000)	*	< LOD	< LOD	.500 (<LOD-.700)	.700 (<LOD-1.20)	819
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	.400 (.300-.600)	1041
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	.600 (<LOD-1.30)	1072
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	.500 (.400-.500)	1041
Females (2009 - 2010)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.300)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.4, 0.3, 0.4, 0.4, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluoroheptanoic acid (PFHpA) (1999 – 2010)

CAS Number 375-85-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	.500 (<LOD-.900)	.900 (.500-1.30)	584
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	.500 (<LOD-.900)	485
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	.500 (<LOD-1.50)	499
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	.500 (<LOD-.500)	391
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.300)	461
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	.600 (<LOD-1.20)	303
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	538
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	.500 (<LOD-1.80)	544
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	.600 (.400-.700)	419
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.100 (.100-.200)	.200 (.200-.200)	391
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	.400 (<LOD-.600)	.600 (.500-.900)	519
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.300 (<LOD-.500)	962
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	.800 (<LOD-2.10)	935
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	.500 (.400-.700)	931
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.300)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.4, 0.3, 0.4, 0.4, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluoroheptanoic acid (PFHpA) (2011 – 2014)‡

CAS Number 375-85-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	.140 (.120-.170)	.220 (.180-.260)	1904
Total population (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.100)	.200 (.100-.200)	2168
Age 12-19 years (2011 - 2012)	*	< LOD	.100 (<LOD-.130)	.160 (.130-.200)	.190 (.160-.270)	344
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.100-.600)	402
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	.140 (.120-.180)	.220 (.160-.280)	1560
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.100)	.100 (.100-.200)	1766
Males (2011 - 2012)	*	< LOD	< LOD	.140 (.120-.200)	.220 (.180-.270)	966
Males (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.100)	.100 (.100-.200)	1032
Females (2011 - 2012)	*	< LOD	< LOD	.140 (.110-.180)	.200 (.140-.360)	938
Females (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.100)	.200 (.100-.300)	1136
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	.130 (<LOD-.180)	.170 (.120-.230)	211
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	.100 (<LOD-.300)	332
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	.130 (.100-.150)	.180 (.140-.230)	485
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.100)	.100 (<LOD-.200)	455
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	.150 (.120-.190)	.230 (.160-.290)	666
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.100)	.200 (.100-.200)	862
All Hispanics (2011 - 2012)	*	< LOD	< LOD	.140 (.100-.180)	.190 (.160-.230)	406
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	.100 (<LOD-.300)	537
Asians (2011 - 2012)	*	< LOD	< LOD	.160 (.120-.220)	.230 (.180-.310)	291
Asians (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.100)	.100 (.100-.200)	236

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.1 and 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2013-2014.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluoroheptanoic acid (PFHpA) (2013 – 2014)

CAS Number 375-85-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	.150 (.110-.190)	.210 (.150-.300)	639
Age 3-5 years (2013 - 2014)	*	< LOD	.110 (<LOD-.170)	.190 (.140-.310)	.310 (.180-.440)	181
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	.130 (<LOD-.150)	.170 (.130-.240)	458
Males (2013 - 2014)	*	< LOD	< LOD	.140 (.110-.180)	.190 (.140-.300)	343
Females (2013 - 2014)	*	< LOD	< LOD	.150 (<LOD-.250)	.230 (.150-.390)	296
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.170 (.110-.230)	.230 (.170-.250)	220
Other (2013 - 2014)	*	< LOD	< LOD	.150 (.100-.190)	.190 (.140-.390)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorohexane sulfonic acid (PFHxS) (1999 – 2010)

CAS Number 355-46-4

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	2.13 (1.91-2.38)	2.10 (1.80-2.30)	3.40 (3.10-4.00)	5.80 (5.20-6.90)	8.70 (7.00-10.0)	1562
Total population (2003 - 2004)	1.93 (1.73-2.16)	1.90 (1.70-2.10)	3.30 (2.80-3.90)	5.90 (4.80-7.20)	8.30 (7.10-9.70)	2094
Total population (2005 - 2006)	1.67 (1.42-1.98)	1.80 (1.50-2.10)	3.20 (2.60-4.00)	5.40 (4.40-7.10)	8.30 (5.80-11.9)	2120
Total population (2007 - 2008)	1.95 (1.76-2.17)	2.00 (1.80-2.10)	3.50 (3.10-4.00)	5.90 (4.90-8.30)	9.80 (6.10-15.2)	2100
Total population (2009 - 2010)	1.66 (1.51-1.82)	1.70 (1.50-1.90)	3.00 (2.60-3.30)	4.80 (4.40-5.30)	6.90 (5.90-7.60)	2233
Age 12-19 years (1999 - 2000)	2.69 (2.14-3.39)	2.50 (2.00-3.70)	5.00 (3.60-6.50)	8.00 (5.80-12.9)	12.9 (6.90-16.4)	543
Age 12-19 years (2003 - 2004)	2.44 (2.05-2.90)	2.40 (1.80-3.20)	4.90 (4.00-6.30)	9.50 (6.80-12.5)	13.3 (9.90-19.6)	640
Age 12-19 years (2005 - 2006)	2.09 (1.74-2.52)	2.40 (2.00-2.90)	4.30 (3.70-5.40)	9.50 (6.40-13.1)	14.1 (9.80-17.8)	640
Age 12-19 years (2007 - 2008)	2.40 (2.09-2.75)	2.30 (1.80-2.70)	4.30 (3.70-5.70)	9.90 (6.50-12.5)	15.9 (11.1-21.5)	357
Age 12-19 years (2009 - 2010)	2.03 (1.77-2.33)	1.90 (1.60-2.10)	3.80 (3.20-4.20)	8.10 (6.30-9.70)	12.3 (8.60-19.0)	364
Age 20+ years (1999 - 2000)	2.05 (1.85-2.27)	2.00 (1.80-2.30)	3.30 (3.00-3.70)	5.40 (4.90-5.90)	8.20 (6.70-9.50)	1019
Age 20+ years (2003 - 2004)	1.86 (1.67-2.08)	1.80 (1.60-2.10)	3.00 (2.60-3.60)	5.50 (4.50-6.70)	7.60 (6.30-9.40)	1454
Age 20+ years (2005 - 2006)	1.62 (1.37-1.92)	1.70 (1.50-2.10)	3.10 (2.50-3.80)	5.20 (4.20-6.50)	7.20 (5.10-11.6)	1480
Age 20+ years (2007 - 2008)	1.90 (1.69-2.13)	1.90 (1.70-2.10)	3.30 (2.90-3.90)	5.80 (4.50-8.00)	9.00 (5.60-15.0)	1743
Age 20+ years (2009 - 2010)	1.61 (1.45-1.79)	1.70 (1.50-1.90)	2.90 (2.50-3.30)	4.50 (4.00-5.20)	6.00 (5.40-7.10)	1869
Males (1999 - 2000)	2.61 (2.27-3.00)	2.60 (2.20-3.00)	4.10 (3.50-4.70)	6.60 (5.30-9.40)	10.5 (6.90-15.0)	743
Males (2003 - 2004)	2.17 (1.87-2.51)	2.10 (1.80-2.40)	3.40 (2.80-4.50)	6.10 (4.60-8.10)	8.50 (6.50-10.5)	1053
Males (2005 - 2006)	2.08 (1.76-2.45)	2.20 (1.80-2.70)	3.70 (3.20-4.60)	6.40 (4.80-9.30)	9.50 (6.70-13.7)	1048
Males (2007 - 2008)	2.63 (2.36-2.94)	2.60 (2.40-2.80)	4.20 (3.80-4.90)	7.30 (5.50-11.0)	11.4 (7.10-18.1)	1059
Males (2009 - 2010)	2.21 (1.99-2.46)	2.20 (1.90-2.50)	3.40 (3.00-4.00)	5.50 (5.00-6.40)	7.80 (6.50-9.90)	1075
Females (1999 - 2000)	1.79 (1.56-2.06)	1.70 (1.50-2.10)	2.80 (2.30-3.50)	5.10 (4.10-6.70)	8.00 (5.70-9.00)	819
Females (2003 - 2004)	1.72 (1.56-1.91)	1.60 (1.40-1.80)	2.90 (2.50-3.50)	5.80 (4.60-7.10)	8.20 (6.70-10.0)	1041
Females (2005 - 2006)	1.37 (1.15-1.63)	1.50 (1.20-1.70)	2.80 (2.20-3.30)	4.60 (3.90-5.80)	6.60 (5.60-9.30)	1072
Females (2007 - 2008)	1.46 (1.30-1.64)	1.40 (1.30-1.50)	2.60 (2.20-3.10)	4.70 (3.80-6.10)	7.50 (5.00-12.5)	1041
Females (2009 - 2010)	1.26 (1.14-1.40)	1.30 (1.20-1.40)	2.20 (2.00-2.60)	4.00 (3.50-4.50)	5.40 (4.70-6.50)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.3, 0.1, 0.1, and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorohexane sulfonic acid (PFHxS) (1999 – 2010)

CAS Number 355-46-4

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	1.47 (1.13-1.92)	1.50 (1.00-2.00)	2.80 (1.80-3.80)	4.50 (3.30-6.90)	6.70 (4.60-9.50)	584
Mexican Americans (2003 - 2004)	1.42 (1.17-1.72)	1.50 (1.20-1.70)	2.30 (1.90-2.90)	4.30 (3.10-5.10)	5.50 (4.00-8.90)	485
Mexican Americans (2005 - 2006)	1.25 (.884-1.76)	1.60 (1.20-2.10)	2.80 (2.50-3.40)	4.30 (3.60-5.20)	6.00 (4.60-7.20)	499
Mexican Americans (2007 - 2008)	1.65 (1.46-1.86)	1.70 (1.40-1.90)	3.00 (2.70-3.40)	5.00 (3.70-6.10)	6.70 (5.20-10.7)	391
Mexican Americans (2009 - 2010)	1.01 (.835-1.22)	1.10 (.800-1.30)	1.80 (1.50-2.20)	3.10 (2.50-3.70)	4.00 (3.20-5.30)	461
Non-Hispanic blacks (1999 - 2000)	2.14 (1.58-2.89)	2.10 (1.40-3.00)	3.40 (2.70-5.00)	6.70 (3.90-10.7)	10.7 (6.80-14.3)	303
Non-Hispanic blacks (2003 - 2004)	1.92 (1.62-2.26)	1.90 (1.60-2.20)	3.50 (2.80-4.60)	6.00 (5.00-7.10)	8.30 (6.30-12.0)	538
Non-Hispanic blacks (2005 - 2006)	1.53 (1.13-2.07)	1.70 (1.40-2.20)	3.30 (2.50-4.10)	5.40 (3.90-7.50)	7.50 (5.30-11.0)	544
Non-Hispanic blacks (2007 - 2008)	1.98 (1.55-2.52)	2.10 (1.80-2.50)	3.90 (2.80-5.40)	7.90 (4.20-12.5)	11.1 (5.90-17.2)	419
Non-Hispanic blacks (2009 - 2010)	1.44 (1.26-1.64)	1.40 (1.20-1.70)	2.60 (2.10-3.00)	4.40 (3.80-5.20)	6.50 (4.60-8.20)	391
Non-Hispanic whites (1999 - 2000)	2.30 (2.06-2.56)	2.30 (1.90-2.60)	3.60 (3.20-4.20)	5.90 (5.30-7.00)	8.40 (7.00-9.70)	519
Non-Hispanic whites (2003 - 2004)	2.01 (1.77-2.27)	1.90 (1.70-2.20)	3.30 (2.80-4.10)	6.10 (4.70-7.80)	8.20 (6.90-10.1)	962
Non-Hispanic whites (2005 - 2006)	1.79 (1.48-2.17)	1.80 (1.50-2.20)	3.30 (2.70-4.30)	5.60 (4.60-8.20)	9.40 (6.10-13.1)	935
Non-Hispanic whites (2007 - 2008)	2.13 (1.89-2.41)	2.10 (1.80-2.40)	3.70 (3.20-4.20)	6.40 (5.30-9.00)	10.5 (6.50-15.6)	931
Non-Hispanic whites (2009 - 2010)	1.93 (1.77-2.10)	2.00 (1.80-2.20)	3.30 (2.90-3.70)	5.30 (4.80-5.60)	7.30 (6.20-8.80)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.3, 0.1, 0.1, and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorohexane sulfonic acid (PFHxS) (2011 – 2016)

CAS Number 355-46-4

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.28 (1.15-1.43)	1.27 (1.11-1.45)	2.26 (2.01-2.61)	3.85 (3.28-4.61)	5.44 (4.61-6.82)	1904
Total population (2013 - 2014)	1.35 (1.20-1.52)	1.40 (1.20-1.60)	2.40 (2.20-2.70)	4.10 (3.60-4.80)	5.60 (4.70-7.10)	2168
Total population (2015 - 2016)	1.18 (1.08-1.30)	1.20 (1.10-1.40)	2.10 (1.80-2.30)	3.40 (3.00-3.90)	4.90 (4.10-5.80)	1993
Age 12-19 years (2011 - 2012)	1.28 (1.08-1.51)	1.13 (.920-1.45)	2.17 (1.53-2.79)	4.53 (2.76-5.72)	6.45 (4.21-9.34)	344
Age 12-19 years (2013 - 2014)	1.27 (1.06-1.53)	1.10 (.900-1.40)	2.10 (1.50-2.90)	4.10 (2.50-6.30)	6.30 (4.00-9.40)	402
Age 12-19 years (2015 - 2016)	.918 (.778-1.08)	.900 (.700-1.20)	1.50 (1.20-1.70)	2.30 (1.80-2.60)	3.10 (2.30-5.80)	353
Age 20+ years (2011 - 2012)	1.28 (1.14-1.43)	1.28 (1.13-1.47)	2.29 (2.02-2.62)	3.76 (3.17-4.61)	5.05 (4.61-6.44)	1560
Age 20+ years (2013 - 2014)	1.36 (1.21-1.53)	1.40 (1.30-1.60)	2.50 (2.20-2.80)	4.10 (3.60-4.80)	5.50 (4.80-7.10)	1766
Age 20+ years (2015 - 2016)	1.22 (1.11-1.34)	1.30 (1.20-1.40)	2.10 (1.80-2.50)	3.50 (3.00-4.20)	5.00 (4.10-6.20)	1640
Males (2011 - 2012)	1.68 (1.50-1.89)	1.73 (1.46-2.03)	2.75 (2.37-3.28)	4.46 (3.76-5.09)	6.90 (4.99-8.59)	966
Males (2013 - 2014)	1.84 (1.59-2.12)	1.90 (1.60-2.10)	3.00 (2.50-3.40)	4.60 (4.00-5.70)	6.30 (5.20-8.80)	1032
Males (2015 - 2016)	1.61 (1.46-1.78)	1.60 (1.50-1.70)	2.50 (2.20-2.90)	3.90 (3.30-5.00)	5.80 (4.40-6.40)	964
Females (2011 - 2012)	.989 (.876-1.12)	.970 (.880-1.07)	1.71 (1.39-2.05)	2.96 (2.23-4.28)	4.61 (3.00-5.61)	938
Females (2013 - 2014)	1.01 (.909-1.12)	1.00 (.900-1.10)	1.80 (1.60-2.10)	3.40 (2.80-4.10)	4.90 (3.80-5.90)	1136
Females (2015 - 2016)	.876 (.775-.990)	.900 (.800-1.00)	1.50 (1.40-1.70)	2.50 (2.10-3.50)	3.80 (2.90-5.70)	1029
Mexican Americans (2011 - 2012)	.927 (.771-1.12)	.980 (.690-1.28)	1.56 (1.22-2.06)	2.26 (1.95-2.54)	2.78 (2.26-4.78)	211
Mexican Americans (2013 - 2014)	.973 (.866-1.09)	1.10 (1.00-1.10)	1.60 (1.40-1.80)	2.40 (2.10-2.70)	2.90 (2.60-4.30)	332
Mexican Americans (2015 - 2016)	.900 (.710-1.14)	1.00 (.700-1.20)	1.60 (1.30-1.90)	2.50 (1.90-3.30)	3.40 (2.40-4.30)	370
Non-Hispanic blacks (2011 - 2012)	1.13 (1.03-1.23)	1.10 (1.01-1.22)	2.10 (1.84-2.35)	3.44 (2.86-4.15)	4.97 (3.68-6.89)	485
Non-Hispanic blacks (2013 - 2014)	1.16 (1.00-1.33)	1.20 (1.00-1.40)	2.20 (1.80-2.70)	3.60 (2.90-5.10)	5.60 (3.80-9.80)	455
Non-Hispanic blacks (2015 - 2016)	.997 (.794-1.25)	1.20 (.900-1.40)	2.00 (1.70-2.40)	3.20 (2.40-4.50)	4.50 (3.20-6.20)	439
Non-Hispanic whites (2011 - 2012)	1.46 (1.28-1.66)	1.41 (1.20-1.69)	2.50 (2.10-3.00)	4.30 (3.47-4.99)	5.62 (4.70-7.60)	666
Non-Hispanic whites (2013 - 2014)	1.53 (1.28-1.83)	1.50 (1.30-1.90)	2.70 (2.20-3.30)	4.80 (3.80-5.70)	5.90 (4.80-9.30)	862
Non-Hispanic whites (2015 - 2016)	1.32 (1.19-1.46)	1.30 (1.20-1.50)	2.20 (1.80-2.60)	3.50 (3.00-4.80)	5.80 (4.20-6.40)	619
All Hispanics (2011 - 2012)	.904 (.737-1.11)	.950 (.730-1.23)	1.66 (1.36-2.06)	2.54 (2.06-3.15)	3.59 (2.52-5.42)	406
All Hispanics (2013 - 2014)	1.00 (.875-1.14)	1.10 (1.00-1.20)	1.80 (1.50-2.00)	2.70 (2.20-3.60)	3.90 (2.90-4.50)	537
All Hispanics (2015 - 2016)	.908 (.741-1.11)	1.00 (.800-1.20)	1.60 (1.30-2.00)	2.60 (1.90-3.60)	3.50 (2.50-5.40)	629
Asians (2011 - 2012)	.942 (.791-1.12)	.980 (.820-1.20)	1.69 (1.41-1.94)	2.62 (2.13-3.50)	3.72 (2.75-5.98)	291
Asians (2013 - 2014)	1.15 (.948-1.40)	1.20 (.900-1.60)	2.20 (1.70-2.70)	3.30 (2.60-4.20)	4.40 (3.30-5.90)	236
Asians (2015 - 2016)	.946 (.821-1.09)	1.00 (.800-1.20)	1.70 (1.50-2.30)	2.90 (2.30-3.80)	3.80 (2.80-4.40)	220

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.1, 0.1, and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorohexane sulfonic acid (PFHxS) (2013 – 2014)

CAS Number 355-46-4

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.843 (.756-.939)	.810 (.710-.900)	1.24 (1.08-1.47)	2.14 (1.62-2.81)	3.12 (2.29-4.59)	639
Age 3-5 years (2013 - 2014)	.715 (.617-.828)	.740 (.580-.830)	1.04 (.920-1.24)	1.55 (1.07-2.41)	1.62 (1.31-3.66)	181
Age 6-11 years (2013 - 2014)	.913 (.803-1.04)	.850 (.730-.960)	1.41 (1.13-1.65)	2.33 (1.84-3.20)	4.14 (2.33-6.42)	458
Males (2013 - 2014)	.933 (.813-1.07)	.930 (.770-1.02)	1.54 (1.24-1.59)	2.32 (1.64-3.70)	3.73 (2.32-5.97)	343
Females (2013 - 2014)	.757 (.672-.853)	.740 (.620-.830)	1.03 (.930-1.19)	1.65 (1.41-2.26)	2.94 (1.75-3.74)	296
All Hispanics (2013 - 2014)	.787 (.697-.890)	.740 (.640-.810)	1.13 (1.01-1.39)	2.20 (1.31-3.20)	2.81 (1.88-5.89)	220
Other (2013 - 2014)	.862 (.761-.977)	.840 (.710-.940)	1.29 (1.08-1.55)	2.14 (1.62-3.02)	3.56 (2.32-4.74)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorononanoic acid (PFNA) (1999 – 2010)

CAS Number 375-95-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.551 (.456-.666)	.600 (.500-.700)	.900 (.700-1.00)	1.30 (1.00-1.90)	1.80 (1.30-2.40)	1562
Total population (2003 - 2004)	.966 (.816-1.14)	1.00 (.900-1.10)	1.50 (1.20-1.80)	2.30 (1.60-4.30)	3.20 (1.80-7.70)	2094
Total population (2005 - 2006)	1.09 (.909-1.29)	1.10 (.900-1.20)	1.70 (1.30-2.10)	2.60 (1.80-4.20)	3.60 (2.50-5.70)	2120
Total population (2007 - 2008)	1.22 (1.12-1.32)	1.23 (1.15-1.31)	1.72 (1.56-1.89)	2.62 (2.30-2.87)	3.28 (2.95-3.77)	2100
Total population (2009 - 2010)	1.26 (1.11-1.44)	1.23 (1.07-1.31)	1.80 (1.48-2.13)	2.71 (1.97-4.26)	3.77 (2.30-7.22)	2233
Age 12-19 years (1999 - 2000)	.473 (.406-.551)	.500 (.400-.600)	.700 (.600-.800)	.900 (.800-1.10)	1.20 (.900-1.40)	543
Age 12-19 years (2003 - 2004)	.852 (.697-1.04)	.800 (.700-1.00)	1.20 (1.00-1.60)	1.90 (1.20-3.70)	2.80 (1.30-6.30)	640
Age 12-19 years (2005 - 2006)	.929 (.782-1.10)	.900 (.800-1.10)	1.40 (1.10-1.80)	2.00 (1.60-2.70)	2.70 (2.10-3.40)	640
Age 12-19 years (2007 - 2008)	1.16 (1.04-1.30)	1.15 (.980-1.31)	1.56 (1.31-1.97)	2.05 (1.64-2.71)	2.54 (2.13-3.28)	357
Age 12-19 years (2009 - 2010)	1.10 (.950-1.27)	1.07 (.900-1.23)	1.48 (1.31-1.80)	2.21 (1.48-2.95)	2.62 (1.89-4.84)	364
Age 20+ years (1999 - 2000)	.566 (.464-.690)	.600 (.500-.700)	.900 (.700-1.20)	1.40 (1.00-1.90)	1.90 (1.40-2.40)	1019
Age 20+ years (2003 - 2004)	.984 (.835-1.16)	1.00 (.900-1.10)	1.50 (1.20-1.80)	2.40 (1.60-4.40)	3.40 (1.80-8.40)	1454
Age 20+ years (2005 - 2006)	1.11 (.929-1.33)	1.10 (1.00-1.20)	1.70 (1.30-2.20)	2.60 (1.80-4.40)	3.90 (2.50-5.80)	1480
Age 20+ years (2007 - 2008)	1.23 (1.13-1.33)	1.23 (1.15-1.31)	1.72 (1.64-1.89)	2.62 (2.38-2.95)	3.36 (3.03-3.77)	1743
Age 20+ years (2009 - 2010)	1.29 (1.13-1.47)	1.23 (1.15-1.39)	1.80 (1.56-2.21)	2.71 (1.97-4.67)	3.94 (2.38-8.36)	1869
Males (1999 - 2000)	.604 (.510-.716)	.600 (.500-.700)	.900 (.800-1.10)	1.30 (1.10-1.80)	1.70 (1.30-2.40)	743
Males (2003 - 2004)	1.09 (.912-1.30)	1.10 (.900-1.20)	1.60 (1.40-1.90)	2.40 (1.70-5.00)	4.00 (1.80-8.70)	1053
Males (2005 - 2006)	1.19 (.993-1.43)	1.20 (1.00-1.30)	1.80 (1.40-2.50)	2.90 (1.80-4.60)	3.90 (2.50-6.70)	1048
Males (2007 - 2008)	1.36 (1.27-1.47)	1.31 (1.23-1.39)	1.89 (1.72-2.05)	2.87 (2.54-3.12)	3.53 (3.12-4.18)	1059
Males (2009 - 2010)	1.37 (1.17-1.59)	1.31 (1.15-1.48)	1.80 (1.56-2.30)	2.79 (1.89-4.84)	4.10 (2.21-12.1)	1075
Females (1999 - 2000)	.508 (.409-.632)	.500 (.400-.600)	.800 (.600-1.00)	1.30 (.900-2.00)	1.80 (1.30-2.60)	819
Females (2003 - 2004)	.861 (.721-1.03)	.900 (.800-1.00)	1.30 (1.00-1.70)	2.20 (1.40-3.40)	3.00 (1.70-6.10)	1041
Females (2005 - 2006)	.992 (.833-1.18)	.900 (.800-1.10)	1.50 (1.20-1.90)	2.40 (1.70-3.50)	3.10 (2.10-5.70)	1072
Females (2007 - 2008)	1.09 (.985-1.21)	1.07 (.980-1.23)	1.56 (1.48-1.72)	2.21 (1.97-2.54)	2.79 (2.54-3.53)	1041
Females (2009 - 2010)	1.17 (1.05-1.31)	1.15 (.980-1.23)	1.72 (1.39-2.05)	2.62 (1.97-3.77)	3.53 (2.30-6.15)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.1, 0.1, 0.082, and 0.082 respectively.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.82 for Survey periods 2007-2008 and 2009-2010 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorononanoic acid (PFNA) (1999 – 2010)

CAS Number 375-95-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.341 (.292-.398)	.400 (.300-.400)	.500 (.400-.700)	.700 (.600-.900)	.900 (.700-1.30)	584
Mexican Americans (2003 - 2004)	.689 (.586-.809)	.700 (.600-.900)	1.10 (.900-1.40)	1.60 (1.30-2.00)	2.00 (1.60-2.80)	485
Mexican Americans (2005 - 2006)	.821 (.710-.951)	.800 (.700-.900)	1.20 (1.10-1.40)	1.60 (1.30-2.30)	2.30 (1.50-3.20)	499
Mexican Americans (2007 - 2008)	1.10 (.967-1.25)	1.15 (.980-1.31)	1.56 (1.39-1.80)	2.13 (1.80-2.71)	2.71 (2.13-3.28)	391
Mexican Americans (2009 - 2010)	.993 (.906-1.09)	.980 (.900-1.07)	1.39 (1.31-1.56)	2.05 (1.80-2.38)	2.46 (2.21-3.03)	461
Non-Hispanic blacks (1999 - 2000)	.764 (.606-.964)	.700 (.600-1.00)	1.30 (.800-1.80)	1.90 (1.50-2.50)	2.50 (1.90-2.90)	303
Non-Hispanic blacks (2003 - 2004)	1.14 (.834-1.54)	1.10 (.900-1.40)	1.70 (1.20-2.90)	3.20 (1.50-6.50)	4.70 (2.10-9.30)	538
Non-Hispanic blacks (2005 - 2006)	1.17 (.916-1.50)	1.20 (.900-1.40)	1.60 (1.30-2.50)	2.60 (1.70-5.60)	4.40 (2.40-8.20)	544
Non-Hispanic blacks (2007 - 2008)	1.35 (1.23-1.48)	1.39 (1.23-1.48)	1.89 (1.72-2.13)	2.79 (2.30-3.36)	3.36 (2.79-4.67)	419
Non-Hispanic blacks (2009 - 2010)	1.42 (1.29-1.56)	1.39 (1.23-1.56)	1.97 (1.80-2.30)	2.79 (2.38-3.36)	3.36 (2.62-4.84)	391
Non-Hispanic whites (1999 - 2000)	.566 (.467-.687)	.600 (.500-.700)	.900 (.700-1.10)	1.30 (1.00-1.90)	1.70 (1.30-2.30)	519
Non-Hispanic whites (2003 - 2004)	.963 (.826-1.12)	.900 (.900-1.10)	1.50 (1.20-1.70)	2.30 (1.60-3.60)	3.00 (1.80-6.20)	962
Non-Hispanic whites (2005 - 2006)	1.10 (.914-1.31)	1.10 (.900-1.20)	1.70 (1.30-2.10)	2.60 (1.80-4.20)	3.50 (2.40-5.70)	935
Non-Hispanic whites (2007 - 2008)	1.22 (1.10-1.34)	1.23 (1.15-1.31)	1.72 (1.48-1.89)	2.54 (2.13-3.03)	3.20 (2.79-3.85)	931
Non-Hispanic whites (2009 - 2010)	1.28 (1.08-1.51)	1.23 (1.07-1.39)	1.80 (1.48-2.21)	2.62 (1.80-5.08)	3.85 (2.05-10.8)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.1, 0.1, 0.082, and 0.082 respectively.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.82 for Survey periods 2007-2008 and 2009-2010 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorononanoic acid (PFNA) (2011 – 2016)

CAS Number 375-95-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.881 (.801-.968)	.860 (.750-.960)	1.30 (1.13-1.45)	1.96 (1.68-2.21)	2.54 (2.28-2.89)	1904
Total population (2013 - 2014)	.675 (.613-.742)	.700 (.600-.800)	1.00 (.900-1.20)	1.60 (1.40-1.70)	2.00 (1.80-2.30)	2168
Total population (2015 - 2016)	.577 (.535-.623)	.600 (.500-.600)	.900 (.800-1.00)	1.40 (1.20-1.50)	1.90 (1.50-2.20)	1993
Age 12-19 years (2011 - 2012)	.741 (.638-.861)	.680 (.620-.810)	1.00 (.800-1.33)	1.67 (1.12-2.06)	2.06 (1.51-3.07)	344
Age 12-19 years (2013 - 2014)	.599 (.492-.730)	.500 (.500-.600)	.800 (.600-1.30)	1.50 (.800-2.80)	2.00 (1.00-3.40)	402
Age 12-19 years (2015 - 2016)	.481 (.440-.526)	.500 (.400-.600)	.700 (.600-.800)	1.00 (.800-1.20)	1.20 (1.00-1.30)	353
Age 20+ years (2011 - 2012)	.903 (.823-.992)	.890 (.800-.980)	1.34 (1.16-1.48)	2.00 (1.71-2.33)	2.64 (2.37-3.03)	1560
Age 20+ years (2013 - 2014)	.685 (.625-.752)	.700 (.600-.800)	1.00 (1.00-1.20)	1.60 (1.40-1.70)	2.00 (1.80-2.30)	1766
Age 20+ years (2015 - 2016)	.591 (.546-.640)	.600 (.500-.600)	.900 (.800-1.00)	1.40 (1.20-1.60)	1.90 (1.60-2.30)	1640
Males (2011 - 2012)	.946 (.836-1.07)	.930 (.810-1.09)	1.36 (1.18-1.52)	1.89 (1.61-2.37)	2.57 (2.14-3.12)	966
Males (2013 - 2014)	.763 (.682-.854)	.800 (.700-.800)	1.10 (1.00-1.30)	1.70 (1.50-1.80)	2.20 (1.80-2.40)	1032
Males (2015 - 2016)	.633 (.577-.693)	.600 (.600-.700)	1.00 (.900-1.10)	1.40 (1.20-1.60)	1.90 (1.60-2.20)	964
Females (2011 - 2012)	.824 (.762-.890)	.770 (.700-.870)	1.19 (1.00-1.44)	2.00 (1.69-2.28)	2.52 (2.20-2.76)	938
Females (2013 - 2014)	.600 (.549-.657)	.600 (.500-.700)	.900 (.900-1.00)	1.50 (1.30-1.60)	1.90 (1.70-2.10)	1136
Females (2015 - 2016)	.529 (.489-.572)	.500 (.500-.600)	.900 (.800-1.00)	1.30 (1.10-1.50)	1.80 (1.40-2.50)	1029
Mexican Americans (2011 - 2012)	.810 (.631-1.04)	.790 (.580-1.10)	1.17 (.840-1.66)	1.74 (1.19-2.47)	2.36 (1.66-2.85)	211
Mexican Americans (2013 - 2014)	.538 (.452-.641)	.500 (.500-.600)	.800 (.600-.900)	1.10 (.800-1.70)	1.60 (1.10-2.10)	332
Mexican Americans (2015 - 2016)	.479 (.392-.585)	.500 (.400-.600)	.700 (.500-1.00)	1.10 (.800-1.60)	1.50 (1.10-2.00)	370
Non-Hispanic blacks (2011 - 2012)	.939 (.842-1.05)	.950 (.870-1.00)	1.35 (1.18-1.59)	2.03 (1.60-3.03)	3.12 (1.89-5.08)	485
Non-Hispanic blacks (2013 - 2014)	.665 (.564-.783)	.700 (.600-.800)	1.10 (.900-1.30)	1.70 (1.30-2.10)	2.20 (1.80-2.50)	455
Non-Hispanic blacks (2015 - 2016)	.572 (.505-.648)	.600 (.500-.700)	.900 (.800-1.20)	1.50 (1.30-1.60)	1.80 (1.50-2.00)	439
Non-Hispanic whites (2011 - 2012)	.864 (.766-.975)	.850 (.710-.980)	1.26 (1.04-1.45)	1.83 (1.54-2.21)	2.37 (2.00-3.14)	666
Non-Hispanic whites (2013 - 2014)	.699 (.621-.786)	.700 (.600-.800)	1.10 (1.00-1.20)	1.60 (1.40-1.80)	2.00 (1.70-2.40)	862
Non-Hispanic whites (2015 - 2016)	.576 (.533-.623)	.600 (.500-.600)	.900 (.800-1.00)	1.30 (1.10-1.50)	1.90 (1.40-2.30)	619
All Hispanics (2011 - 2012)	.850 (.699-1.03)	.840 (.660-1.00)	1.21 (.970-1.67)	1.99 (1.51-2.53)	2.53 (2.07-2.85)	406
All Hispanics (2013 - 2014)	.549 (.484-.622)	.600 (.500-.600)	.800 (.700-.900)	1.10 (.900-1.50)	1.60 (1.20-2.10)	537
All Hispanics (2015 - 2016)	.520 (.452-.599)	.500 (.500-.600)	.800 (.700-1.00)	1.20 (1.00-1.50)	1.60 (1.40-1.80)	629
Asians (2011 - 2012)	1.18 (.996-1.40)	1.18 (.970-1.49)	1.94 (1.56-2.38)	2.96 (2.52-3.50)	3.72 (3.04-4.31)	291
Asians (2013 - 2014)	.893 (.789-1.01)	.900 (.800-1.10)	1.50 (1.20-1.60)	2.20 (1.80-2.80)	3.10 (2.40-4.20)	236
Asians (2015 - 2016)	.771 (.681-.873)	.800 (.700-.900)	1.30 (1.20-1.50)	2.10 (1.60-2.50)	2.60 (2.20-3.20)	220

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.082, 0.1, and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorononanoic acid (PFNA) (2013 – 2014)

CAS Number 375-95-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.794 (.681-.926)	.700 (.610-.820)	1.08 (.920-1.35)	2.03 (1.29-3.42)	3.26 (1.94-5.35)	639
Age 3-5 years (2013 - 2014)	.764 (.630-.928)	.620 (.540-.760)	1.11 (.840-1.53)	2.03 (1.21-5.03)	3.49 (1.41-7.95)	181
Age 6-11 years (2013 - 2014)	.809 (.682-.960)	.750 (.630-.860)	1.07 (.920-1.38)	1.98 (1.16-3.56)	3.19 (1.55-4.88)	458
Males (2013 - 2014)	.829 (.686-1.00)	.720 (.610-.850)	1.10 (.890-1.59)	2.34 (1.17-5.35)	3.85 (1.72-6.93)	343
Females (2013 - 2014)	.759 (.638-.902)	.680 (.570-.870)	1.07 (.890-1.35)	1.88 (1.21-2.84)	2.58 (1.42-4.06)	296
All Hispanics (2013 - 2014)	.753 (.622-.912)	.640 (.540-.760)	1.03 (.790-1.53)	1.98 (1.15-3.26)	3.00 (1.59-9.32)	220
Other (2013 - 2014)	.808 (.681-.958)	.720 (.600-.870)	1.09 (.920-1.38)	2.08 (1.34-3.47)	3.46 (1.88-5.35)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctanoic acid (PFOA) (1999 – 2010)

CAS Number 335-67-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	5.21 (4.72-5.74)	5.20 (4.80-5.90)	6.90 (6.30-7.80)	9.40 (8.20-11.1)	11.9 (10.9-13.5)	1562
Total population (2003 - 2004)	3.95 (3.65-4.27)	4.10 (3.80-4.40)	5.80 (5.30-6.40)	7.80 (6.70-9.60)	9.80 (7.40-14.1)	2094
Total population (2005 - 2006)	3.92 (3.48-4.42)	4.20 (3.80-4.50)	6.20 (5.40-7.20)	9.00 (7.40-11.2)	11.3 (8.80-14.5)	2120
Total population (2007 - 2008)	4.12 (4.01-4.24)	4.30 (4.20-4.50)	5.90 (5.70-6.20)	7.90 (7.50-8.30)	9.60 (8.90-10.1)	2100
Total population (2009 - 2010)	3.07 (2.81-3.36)	3.20 (2.90-3.50)	4.60 (4.10-5.10)	6.00 (5.30-7.20)	7.50 (6.20-9.70)	2233
Age 12-19 years (1999 - 2000)	5.46 (4.98-5.99)	5.60 (4.90-6.10)	6.90 (6.20-7.70)	9.40 (7.70-11.0)	11.6 (10.2-12.5)	543
Age 12-19 years (2003 - 2004)	3.89 (3.47-4.35)	4.00 (3.50-4.50)	5.40 (4.60-6.10)	7.00 (5.60-9.20)	8.60 (5.90-12.6)	640
Age 12-19 years (2005 - 2006)	3.59 (3.26-3.96)	3.80 (3.30-4.20)	5.40 (4.60-5.90)	6.90 (6.30-7.90)	8.40 (7.30-10.1)	640
Age 12-19 years (2007 - 2008)	3.91 (3.71-4.12)	4.00 (3.70-4.40)	5.00 (4.70-5.50)	6.10 (5.70-6.70)	7.30 (6.20-8.00)	357
Age 12-19 years (2009 - 2010)	2.74 (2.46-3.05)	2.90 (2.60-3.10)	3.80 (3.30-4.20)	4.80 (4.10-5.30)	5.00 (4.40-7.20)	364
Age 20+ years (1999 - 2000)	5.16 (4.66-5.72)	5.20 (4.70-5.70)	7.00 (6.30-7.80)	9.40 (8.20-11.1)	12.0 (10.8-14.0)	1019
Age 20+ years (2003 - 2004)	3.96 (3.67-4.27)	4.10 (3.90-4.40)	5.90 (5.40-6.50)	7.80 (6.80-9.60)	9.90 (7.60-14.2)	1454
Age 20+ years (2005 - 2006)	3.97 (3.51-4.49)	4.20 (3.80-4.60)	6.40 (5.40-7.50)	9.30 (7.40-11.9)	11.6 (9.00-14.8)	1480
Age 20+ years (2007 - 2008)	4.15 (4.02-4.30)	4.30 (4.20-4.60)	6.10 (5.80-6.50)	8.10 (7.70-8.70)	9.80 (9.00-10.4)	1743
Age 20+ years (2009 - 2010)	3.12 (2.84-3.43)	3.30 (3.00-3.60)	4.70 (4.20-5.30)	6.40 (5.40-7.50)	7.70 (6.30-10.2)	1869
Males (1999 - 2000)	5.71 (5.17-6.31)	6.00 (5.40-6.50)	7.70 (6.80-8.70)	10.6 (9.00-11.8)	12.1 (11.2-13.1)	743
Males (2003 - 2004)	4.47 (4.07-4.91)	4.60 (4.30-5.00)	6.30 (5.70-7.20)	8.40 (6.80-12.5)	10.7 (7.40-17.5)	1053
Males (2005 - 2006)	4.69 (4.23-5.20)	4.90 (4.40-5.40)	7.20 (6.10-8.00)	9.90 (8.00-12.2)	12.2 (9.60-15.2)	1048
Males (2007 - 2008)	4.80 (4.55-5.06)	4.90 (4.60-5.20)	6.70 (6.30-7.10)	8.70 (8.10-9.30)	10.1 (9.50-11.1)	1059
Males (2009 - 2010)	3.53 (3.22-3.87)	3.70 (3.40-4.00)	4.90 (4.50-5.40)	6.80 (5.40-8.00)	7.90 (6.40-10.2)	1075
Females (1999 - 2000)	4.80 (4.32-5.34)	4.70 (4.40-5.20)	6.30 (5.60-7.10)	8.30 (7.50-9.90)	11.3 (9.20-14.4)	819
Females (2003 - 2004)	3.50 (3.21-3.82)	3.60 (3.30-3.90)	5.20 (4.70-5.80)	7.10 (6.30-8.20)	8.60 (7.40-10.6)	1041
Females (2005 - 2006)	3.31 (2.89-3.79)	3.50 (3.10-4.00)	5.20 (4.40-6.00)	7.90 (6.10-9.70)	10.1 (7.50-14.2)	1072
Females (2007 - 2008)	3.55 (3.38-3.73)	3.70 (3.50-3.90)	5.20 (4.80-5.60)	7.00 (6.50-7.50)	8.30 (7.20-9.90)	1041
Females (2009 - 2010)	2.69 (2.45-2.96)	2.70 (2.50-3.00)	4.10 (3.60-4.70)	5.60 (5.10-6.50)	6.90 (5.80-8.40)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.2, 0.1, 0.1, and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctanoic acid (PFOA) (1999 – 2010)

CAS Number 335-67-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	3.89 (3.58-4.21)	4.20 (3.80-4.60)	5.80 (5.20-6.30)	7.70 (6.40-8.00)	8.20 (7.70-8.90)	584
Mexican Americans (2003 - 2004)	3.11 (2.84-3.40)	3.30 (3.10-3.70)	4.50 (4.20-5.20)	6.70 (5.70-7.30)	7.60 (6.70-10.5)	485
Mexican Americans (2005 - 2006)	2.62 (2.33-2.95)	2.80 (2.50-3.30)	4.30 (3.80-4.70)	5.80 (5.30-6.70)	7.40 (5.90-8.10)	499
Mexican Americans (2007 - 2008)	3.54 (3.35-3.75)	3.80 (3.50-4.00)	5.20 (4.90-5.60)	6.60 (6.20-7.10)	7.60 (6.80-9.00)	391
Mexican Americans (2009 - 2010)	2.26 (2.00-2.54)	2.40 (2.10-2.60)	3.60 (3.10-3.80)	4.60 (4.00-5.30)	5.40 (4.50-6.60)	461
Non-Hispanic blacks (1999 - 2000)	4.78 (4.10-5.57)	4.80 (3.80-5.90)	6.40 (5.90-7.50)	9.00 (7.40-11.5)	11.5 (9.20-14.0)	303
Non-Hispanic blacks (2003 - 2004)	3.37 (2.99-3.79)	3.70 (3.20-4.20)	5.20 (4.40-6.30)	7.70 (5.30-11.6)	9.60 (6.50-13.9)	538
Non-Hispanic blacks (2005 - 2006)	3.27 (2.61-4.08)	3.70 (3.00-4.20)	5.50 (4.40-6.80)	8.10 (6.00-11.3)	10.4 (7.80-12.3)	544
Non-Hispanic blacks (2007 - 2008)	3.86 (3.57-4.16)	4.00 (3.50-4.30)	5.90 (5.20-6.50)	7.80 (7.10-8.70)	9.20 (8.50-10.1)	419
Non-Hispanic blacks (2009 - 2010)	2.74 (2.47-3.04)	2.80 (2.60-3.00)	4.00 (3.70-4.40)	5.50 (5.00-6.20)	6.70 (5.60-9.40)	391
Non-Hispanic whites (1999 - 2000)	5.61 (5.06-6.23)	5.60 (4.90-6.20)	7.30 (6.50-8.20)	10.3 (8.40-12.1)	13.0 (11.0-14.9)	519
Non-Hispanic whites (2003 - 2004)	4.18 (3.85-4.53)	4.30 (3.90-4.70)	6.00 (5.50-6.70)	7.90 (7.20-9.20)	9.90 (7.60-13.3)	962
Non-Hispanic whites (2005 - 2006)	4.27 (3.80-4.81)	4.40 (4.00-5.00)	6.60 (5.60-7.80)	9.60 (7.40-12.2)	11.6 (8.80-14.8)	935
Non-Hispanic whites (2007 - 2008)	4.38 (4.20-4.56)	4.60 (4.30-4.70)	6.10 (5.80-6.60)	8.20 (7.80-8.80)	9.90 (9.30-10.6)	931
Non-Hispanic whites (2009 - 2010)	3.36 (3.06-3.69)	3.50 (3.20-3.90)	4.80 (4.40-5.40)	6.60 (5.40-7.80)	7.80 (6.20-10.5)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.2, 0.1, 0.1, and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctanoic acid (PFOA) (2011 – 2016)‡

CAS Number 335-67-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	2.08 (1.95-2.22)	2.08 (1.96-2.26)	3.03 (2.76-3.27)	4.35 (3.82-4.85)	5.68 (5.02-6.49)	1904
Total population (2013 - 2014)	1.94 (1.76-2.14)	2.07 (1.87-2.20)	3.07 (2.67-3.37)	4.27 (3.57-5.17)	5.57 (4.60-6.27)	2165
Total population (2015 - 2016)	1.56 (1.47-1.66)	1.57 (1.47-1.77)	2.47 (2.27-2.57)	3.37 (3.07-3.57)	4.17 (3.87-4.67)	1993
Age 12-19 years (2011 - 2012)	1.80 (1.71-1.91)	1.74 (1.67-1.89)	2.41 (2.17-2.62)	2.93 (2.68-3.19)	3.59 (2.93-4.25)	344
Age 12-19 years (2013 - 2014)	1.66 (1.50-1.84)	1.67 (1.37-1.97)	2.20 (1.97-2.57)	2.87 (2.57-3.40)	3.47 (2.87-4.37)	401
Age 12-19 years (2015 - 2016)	1.25 (1.14-1.37)	1.27 (1.17-1.47)	1.67 (1.47-1.87)	2.07 (1.77-2.57)	2.47 (2.07-2.97)	353
Age 20+ years (2011 - 2012)	2.12 (1.98-2.28)	2.16 (2.01-2.33)	3.15 (2.90-3.36)	4.64 (3.93-5.25)	5.94 (5.34-7.45)	1560
Age 20+ years (2013 - 2014)	1.98 (1.79-2.19)	2.07 (1.90-2.27)	3.17 (2.77-3.47)	4.47 (3.70-5.27)	5.60 (4.67-6.40)	1764
Age 20+ years (2015 - 2016)	1.60 (1.51-1.71)	1.67 (1.57-1.87)	2.47 (2.37-2.67)	3.47 (3.17-3.67)	4.27 (4.07-4.97)	1640
Males (2011 - 2012)	2.37 (2.22-2.53)	2.38 (2.26-2.56)	3.25 (3.00-3.56)	4.61 (4.11-5.02)	5.62 (4.85-6.20)	966
Males (2013 - 2014)	2.29 (2.09-2.50)	2.37 (2.17-2.57)	3.27 (2.87-3.60)	4.67 (3.77-5.60)	5.67 (4.67-6.27)	1031
Males (2015 - 2016)	1.80 (1.66-1.94)	1.87 (1.67-2.07)	2.57 (2.40-2.67)	3.37 (3.07-3.67)	4.07 (3.67-4.87)	964
Females (2011 - 2012)	1.84 (1.68-2.01)	1.78 (1.62-1.98)	2.65 (2.34-3.14)	3.91 (3.36-4.99)	5.68 (4.33-8.45)	938
Females (2013 - 2014)	1.66 (1.48-1.87)	1.67 (1.47-1.87)	2.67 (2.27-3.07)	3.77 (3.37-4.70)	5.07 (4.07-6.70)	1134
Females (2015 - 2016)	1.36 (1.29-1.45)	1.37 (1.27-1.47)	2.17 (1.97-2.47)	3.37 (2.87-3.67)	4.17 (3.67-4.97)	1029
Mexican Americans (2011 - 2012)	1.66 (1.37-2.02)	1.71 (1.32-2.23)	2.43 (1.98-2.98)	3.38 (2.43-4.48)	4.08 (2.98-6.15)	211
Mexican Americans (2013 - 2014)	1.36 (1.25-1.47)	1.37 (1.27-1.47)	1.97 (1.87-2.10)	2.70 (2.40-3.10)	3.17 (2.57-3.77)	332
Mexican Americans (2015 - 2016)	1.14 (1.01-1.28)	1.17 (1.07-1.27)	1.67 (1.47-1.87)	2.47 (1.87-2.97)	2.77 (2.20-4.67)	370
Non-Hispanic blacks (2011 - 2012)	1.80 (1.71-1.90)	1.94 (1.76-2.09)	2.82 (2.65-2.95)	3.94 (3.51-4.40)	5.11 (4.40-5.79)	485
Non-Hispanic blacks (2013 - 2014)	1.52 (1.34-1.73)	1.67 (1.37-1.97)	2.57 (2.17-2.97)	3.60 (3.07-4.50)	4.60 (3.40-5.77)	455
Non-Hispanic blacks (2015 - 2016)	1.36 (1.21-1.53)	1.37 (1.27-1.57)	2.17 (1.97-2.57)	3.37 (2.77-3.77)	4.07 (3.57-5.27)	439
Non-Hispanic whites (2011 - 2012)	2.25 (2.05-2.47)	2.25 (1.98-2.48)	3.21 (2.90-3.50)	4.68 (3.95-5.35)	6.20 (5.34-7.74)	666
Non-Hispanic whites (2013 - 2014)	2.20 (1.91-2.52)	2.27 (1.97-2.67)	3.37 (2.77-3.77)	4.77 (3.77-5.67)	5.77 (4.80-6.87)	861
Non-Hispanic whites (2015 - 2016)	1.69 (1.57-1.82)	1.77 (1.57-1.97)	2.57 (2.47-2.67)	3.47 (3.17-3.67)	4.47 (3.87-5.17)	619
All Hispanics (2011 - 2012)	1.70 (1.48-1.95)	1.79 (1.59-1.95)	2.46 (2.15-2.91)	3.60 (2.95-4.48)	4.70 (3.87-5.94)	406
All Hispanics (2013 - 2014)	1.45 (1.33-1.59)	1.47 (1.37-1.67)	2.10 (1.97-2.40)	3.07 (2.67-3.27)	3.47 (3.17-3.97)	537
All Hispanics (2015 - 2016)	1.25 (1.14-1.36)	1.27 (1.17-1.47)	1.87 (1.67-2.20)	2.67 (2.37-3.07)	3.17 (2.77-4.17)	629
Asians (2011 - 2012)	2.08 (1.83-2.36)	2.21 (2.04-2.27)	2.92 (2.55-3.45)	4.66 (3.42-5.79)	5.79 (4.93-8.91)	291
Asians (2013 - 2014)	1.97 (1.75-2.23)	1.87 (1.67-2.27)	2.97 (2.47-3.57)	4.67 (3.97-5.77)	5.90 (5.00-6.40)	234
Asians (2015 - 2016)	1.66 (1.42-1.94)	1.77 (1.37-2.07)	2.37 (2.17-2.87)	3.77 (2.97-4.47)	4.77 (3.87-7.57)	220

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.1.

‡See [Calculation of PFOS and PFOA as the Sum of Isomers](#) for additional information about Survey years 2013-2014 and 2015-2016.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctanoic acid (PFOA) (2013 – 2014)‡

CAS Number 335-67-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	1.92 (1.75-2.12)	1.94 (1.66-2.15)	2.67 (2.42-2.88)	3.53 (3.13-4.09)	4.19 (3.62-5.47)	639
Age 3-5 years (2013 - 2014)	2.00 (1.75-2.29)	1.80 (1.62-2.40)	2.94 (2.66-3.28)	4.14 (2.88-5.86)	5.58 (3.28-7.02)	181
Age 6-11 years (2013 - 2014)	1.89 (1.72-2.07)	1.94 (1.68-2.14)	2.53 (2.25-2.84)	3.26 (2.97-3.68)	3.84 (3.40-4.09)	458
Males (2013 - 2014)	1.95 (1.76-2.15)	1.90 (1.64-2.19)	2.71 (2.39-3.26)	3.62 (3.23-4.00)	4.14 (3.41-5.86)	343
Females (2013 - 2014)	1.90 (1.68-2.14)	1.94 (1.63-2.18)	2.55 (2.30-2.80)	3.30 (2.88-4.01)	4.22 (3.07-5.47)	296
All Hispanics (2013 - 2014)	1.71 (1.56-1.88)	1.68 (1.55-1.93)	2.31 (2.05-2.60)	2.91 (2.48-3.30)	3.29 (2.86-4.00)	220
Other (2013 - 2014)	2.00 (1.79-2.23)	1.99 (1.71-2.34)	2.75 (2.50-3.16)	3.72 (3.20-4.22)	4.28 (3.79-5.86)	419

‡ See [Calculation of PFOS and PFOA as the Sum of Isomers](#) for additional information.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum n-Perfluorooctanoic acid (n-PFOA) (2013 – 2016)

CAS Number 335-67-1

Linear PFOA isomer

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	1.83 (1.65-2.03)	1.90 (1.80-2.10)	2.90 (2.60-3.20)	4.10 (3.50-5.10)	5.30 (4.40-6.00)	2165
Total population (2015 - 2016)	1.46 (1.37-1.56)	1.50 (1.40-1.70)	2.40 (2.20-2.50)	3.30 (3.00-3.50)	4.10 (3.80-4.60)	1993
Age 12-19 years (2013 - 2014)	1.56 (1.41-1.74)	1.60 (1.30-1.80)	2.10 (1.90-2.50)	2.70 (2.30-3.40)	3.40 (2.70-4.80)	401
Age 12-19 years (2015 - 2016)	1.17 (1.06-1.28)	1.20 (1.10-1.40)	1.60 (1.40-1.80)	2.00 (1.70-2.50)	2.40 (2.00-2.90)	353
Age 20+ years (2013 - 2014)	1.87 (1.68-2.08)	2.00 (1.80-2.20)	3.00 (2.70-3.30)	4.40 (3.60-5.10)	5.40 (4.60-6.20)	1764
Age 20+ years (2015 - 2016)	1.50 (1.41-1.61)	1.60 (1.50-1.80)	2.40 (2.30-2.60)	3.40 (3.10-3.60)	4.20 (4.00-4.90)	1640
Males (2013 - 2014)	2.18 (1.98-2.39)	2.30 (2.10-2.50)	3.20 (2.80-3.50)	4.60 (3.70-5.30)	5.40 (4.60-5.90)	1031
Males (2015 - 2016)	1.70 (1.56-1.86)	1.80 (1.60-2.00)	2.50 (2.30-2.60)	3.30 (3.00-3.60)	4.00 (3.60-4.80)	964
Females (2013 - 2014)	1.55 (1.37-1.75)	1.60 (1.40-1.80)	2.60 (2.20-2.90)	3.70 (3.30-4.70)	4.80 (3.90-6.60)	1134
Females (2015 - 2016)	1.26 (1.18-1.35)	1.30 (1.20-1.40)	2.10 (1.90-2.40)	3.30 (2.80-3.60)	4.10 (3.60-4.90)	1029
Mexican Americans (2013 - 2014)	1.27 (1.16-1.38)	1.30 (1.20-1.40)	1.90 (1.80-2.00)	2.60 (2.30-3.10)	3.10 (2.50-3.70)	332
Mexican Americans (2015 - 2016)	1.04 (.918-1.19)	1.10 (1.00-1.20)	1.60 (1.40-1.80)	2.40 (1.80-2.90)	2.70 (2.10-4.60)	370
Non-Hispanic blacks (2013 - 2014)	1.41 (1.23-1.62)	1.60 (1.30-1.90)	2.50 (2.10-2.80)	3.50 (2.90-4.40)	4.40 (3.30-5.70)	455
Non-Hispanic blacks (2015 - 2016)	1.26 (1.11-1.43)	1.30 (1.20-1.50)	2.10 (1.90-2.50)	3.30 (2.70-3.70)	3.90 (3.40-5.20)	439
Non-Hispanic whites (2013 - 2014)	2.08 (1.80-2.41)	2.20 (1.90-2.60)	3.20 (2.70-3.60)	4.60 (3.60-5.50)	5.60 (4.70-6.70)	861
Non-Hispanic whites (2015 - 2016)	1.59 (1.46-1.73)	1.70 (1.50-1.90)	2.50 (2.40-2.60)	3.40 (3.10-3.60)	4.40 (3.80-5.10)	619
All Hispanics (2013 - 2014)	1.35 (1.23-1.49)	1.40 (1.30-1.60)	2.00 (1.90-2.30)	2.90 (2.50-3.10)	3.40 (3.10-3.70)	537
All Hispanics (2015 - 2016)	1.15 (1.05-1.27)	1.20 (1.10-1.40)	1.80 (1.60-2.10)	2.60 (2.30-3.00)	3.10 (2.70-4.10)	629
Asians (2013 - 2014)	1.87 (1.65-2.12)	1.80 (1.60-2.20)	2.90 (2.40-3.50)	4.60 (3.90-5.70)	5.70 (4.70-6.80)	234
Asians (2015 - 2016)	1.57 (1.32-1.85)	1.70 (1.30-2.00)	2.30 (2.10-2.80)	3.70 (2.90-4.40)	4.70 (3.80-7.50)	220

Limit of detection (LOD, see Data Analysis section) for Survey years 13-14 and 15-16 are 0.1 and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum n-Perfluorooctanoic acid (n-PFOA) (2013 – 2014)

CAS Number 335-67-1

Linear PFOA isomer

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	1.81 (1.64-2.01)	1.82 (1.57-2.04)	2.51 (2.30-2.81)	3.46 (2.94-3.94)	4.07 (3.53-5.32)	639
Age 3-5 years (2013 - 2014)	1.87 (1.62-2.17)	1.72 (1.50-2.25)	2.87 (2.50-3.21)	4.07 (2.81-5.79)	5.32 (3.01-6.51)	181
Age 6-11 years (2013 - 2014)	1.78 (1.61-1.97)	1.84 (1.59-2.04)	2.45 (2.18-2.73)	3.19 (2.83-3.61)	3.77 (3.43-3.97)	458
Males (2013 - 2014)	1.83 (1.65-2.04)	1.80 (1.55-2.09)	2.64 (2.28-3.19)	3.55 (3.13-3.93)	4.07 (3.34-5.79)	343
Females (2013 - 2014)	1.79 (1.57-2.03)	1.84 (1.57-2.04)	2.48 (2.23-2.73)	3.21 (2.81-3.97)	4.08 (2.92-5.32)	296
All Hispanics (2013 - 2014)	1.61 (1.46-1.78)	1.60 (1.45-1.83)	2.23 (1.95-2.48)	2.84 (2.37-3.20)	3.18 (2.78-3.93)	220
Other (2013 - 2014)	1.88 (1.68-2.11)	1.88 (1.63-2.23)	2.66 (2.39-3.01)	3.64 (3.13-4.15)	4.15 (3.55-5.79)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum branched Perfluorooctanoic acid (Sb-PFOA) (2013 – 2016)

CAS Number 335-67-1

Branched PFOA isomers

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.300)	2165
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1993
Age 12-19 years (2013 - 2014)	*	< LOD	.100 (<LOD-.100)	.200 (.100-.200)	.200 (.100-.400)	401
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	353
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.100 (.100-.200)	.200 (.200-.300)	1764
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1640
Males (2013 - 2014)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.400)	1031
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	964
Females (2013 - 2014)	*	< LOD	< LOD	.100 (.100-.200)	.200 (.200-.300)	1134
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1029
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.200)	332
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	370
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.300)	455
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	439
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.500)	861
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	619
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.300)	537
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	629
Asians (2013 - 2014)	*	< LOD	< LOD	.100 (<LOD-.400)	.200 (<LOD-3.00)	234
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	220

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.1 and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum branched Perfluorooctanoic acid (Sb-PFOA) (2013 – 2014)

CAS Number 335-67-1

Branched PFOA isomers

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	.100 (<LOD-.120)	.160 (.120-.230)	.230 (.180-.360)	639
Age 3-5 years (2013 - 2014)	*	< LOD	.100 (<LOD-.190)	.200 (.120-.280)	.280 (.160-.510)	181
Age 6-11 years (2013 - 2014)	*	< LOD	.100 (<LOD-.120)	.160 (.130-.200)	.230 (.170-.340)	458
Males (2013 - 2014)	*	< LOD	.110 (<LOD-.130)	.180 (.150-.200)	.220 (.170-.310)	343
Females (2013 - 2014)	*	< LOD	.100 (<LOD-.130)	.160 (.110-.310)	.230 (.150-.450)	296
All Hispanics (2013 - 2014)	*	< LOD	.100 (<LOD-.110)	.150 (.120-.170)	.190 (.150-.250)	220
Other (2013 - 2014)	*	< LOD	.110 (<LOD-.150)	.180 (.130-.230)	.250 (.180-.470)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctane sulfonic acid (PFOS) (1999 – 2010)

CAS Number 1763-23-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	30.4 (27.1-33.9)	30.2 (27.8-33.9)	43.7 (37.5-47.3)	57.0 (50.2-71.7)	75.7 (58.1-97.5)	1562
Total population (2003 - 2004)	20.7 (19.2-22.3)	21.2 (19.8-22.4)	30.0 (27.5-33.0)	41.3 (35.6-50.0)	54.6 (44.0-66.5)	2094
Total population (2005 - 2006)	17.1 (16.0-18.2)	17.5 (16.8-18.6)	27.2 (24.9-29.6)	39.4 (34.9-43.1)	47.5 (42.7-56.8)	2120
Total population (2007 - 2008)	13.2 (12.2-14.2)	13.6 (12.8-14.7)	21.0 (18.9-23.3)	32.6 (29.4-36.3)	40.5 (35.4-47.4)	2100
Total population (2009 - 2010)	9.32 (8.13-10.7)	9.70 (8.50-10.8)	14.8 (12.9-17.3)	23.7 (18.3-30.2)	32.0 (22.6-48.5)	2233
Age 12-19 years (1999 - 2000)	29.1 (26.2-32.4)	29.5 (26.9-34.2)	39.0 (35.9-45.0)	52.7 (46.0-56.2)	57.4 (52.7-66.5)	543
Age 12-19 years (2003 - 2004)	19.3 (17.5-21.4)	19.9 (17.8-22.0)	27.1 (23.7-30.2)	36.5 (28.6-45.6)	42.6 (35.1-52.1)	640
Age 12-19 years (2005 - 2006)	15.0 (14.3-15.7)	14.9 (13.6-16.6)	22.7 (19.7-24.9)	30.6 (27.8-34.1)	38.5 (33.0-44.6)	640
Age 12-19 years (2007 - 2008)	11.3 (10.3-12.3)	11.3 (10.3-13.0)	15.9 (15.1-17.7)	21.7 (17.7-28.2)	28.0 (22.0-32.2)	357
Age 12-19 years (2009 - 2010)	6.84 (5.81-8.06)	6.90 (6.00-8.40)	10.7 (8.90-12.5)	14.4 (12.4-18.1)	18.1 (13.5-26.0)	364
Age 20+ years (1999 - 2000)	30.6 (27.1-34.4)	30.3 (27.9-33.9)	44.4 (37.9-48.0)	58.0 (50.1-75.7)	78.0 (59.9-107)	1019
Age 20+ years (2003 - 2004)	20.9 (19.3-22.5)	21.4 (19.8-22.8)	30.4 (28.1-33.0)	42.7 (35.7-53.3)	57.8 (45.7-69.4)	1454
Age 20+ years (2005 - 2006)	17.4 (16.2-18.7)	18.0 (17.1-19.4)	27.8 (25.3-30.8)	40.2 (35.6-44.5)	49.6 (42.8-60.7)	1480
Age 20+ years (2007 - 2008)	13.5 (12.4-14.6)	14.0 (13.0-15.5)	21.7 (19.5-24.6)	33.9 (29.9-39.0)	42.8 (37.3-50.3)	1743
Age 20+ years (2009 - 2010)	9.72 (8.45-11.2)	10.1 (8.90-11.2)	15.7 (13.4-18.4)	25.3 (19.3-32.9)	34.1 (23.4-52.7)	1869
Males (1999 - 2000)	33.4 (29.6-37.6)	34.9 (31.1-37.9)	46.3 (41.2-51.6)	58.4 (50.2-78.3)	78.3 (58.0-108)	743
Males (2003 - 2004)	23.2 (21.1-25.6)	23.9 (22.4-25.5)	32.2 (28.8-35.9)	45.3 (35.5-62.7)	62.7 (43.8-81.8)	1053
Males (2005 - 2006)	20.5 (19.4-21.8)	21.3 (20.0-22.5)	31.4 (27.9-33.7)	43.3 (38.7-49.7)	54.3 (43.5-80.7)	1048
Males (2007 - 2008)	16.3 (15.0-17.7)	17.0 (15.7-17.8)	23.9 (21.6-26.9)	36.4 (33.5-41.1)	45.3 (40.4-53.1)	1059
Males (2009 - 2010)	11.5 (9.93-13.3)	11.8 (10.6-12.9)	16.8 (14.3-20.4)	25.7 (19.4-39.7)	37.4 (22.5-72.3)	1075
Females (1999 - 2000)	28.0 (24.6-31.8)	27.8 (24.5-30.2)	39.0 (32.7-46.0)	55.4 (46.3-70.2)	75.7 (56.1-98.4)	819
Females (2003 - 2004)	18.4 (17.0-20.0)	18.2 (16.9-19.8)	27.4 (23.8-30.2)	39.8 (34.4-42.6)	46.6 (42.3-61.5)	1041
Females (2005 - 2006)	14.4 (13.3-15.4)	14.6 (13.5-15.9)	23.3 (21.1-25.3)	34.2 (30.6-37.7)	42.8 (38.0-46.5)	1072
Females (2007 - 2008)	10.7 (9.70-11.7)	10.7 (9.80-11.7)	17.2 (15.4-19.1)	28.7 (21.7-32.5)	33.6 (29.9-41.6)	1041
Females (2009 - 2010)	7.65 (6.73-8.71)	7.80 (6.70-9.00)	12.0 (10.8-14.4)	21.1 (16.4-26.9)	28.8 (22.3-34.1)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.4, 0.2, 0.2, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctane sulfonic acid (PFOS) (1999 – 2010)

CAS Number 1763-23-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	22.7 (19.8-25.9)	23.7 (20.8-27.2)	33.0 (27.9-39.7)	41.9 (36.7-54.5)	53.6 (41.3-72.0)	584
Mexican Americans (2003 - 2004)	14.7 (13.0-16.6)	15.9 (13.4-17.9)	21.2 (18.7-23.5)	28.1 (24.1-35.0)	35.5 (28.9-38.5)	485
Mexican Americans (2005 - 2006)	11.2 (10.3-12.2)	11.6 (9.90-13.3)	17.2 (15.4-19.3)	24.9 (22.0-30.3)	31.9 (26.4-40.6)	499
Mexican Americans (2007 - 2008)	10.6 (9.47-11.9)	10.8 (9.70-12.2)	17.1 (14.9-19.2)	26.3 (20.7-30.4)	31.5 (25.7-36.1)	391
Mexican Americans (2009 - 2010)	6.23 (5.28-7.36)	6.10 (5.10-8.10)	11.2 (8.50-14.1)	16.8 (14.9-18.8)	20.4 (17.5-22.7)	461
Non-Hispanic blacks (1999 - 2000)	32.9 (26.0-41.6)	32.0 (23.9-45.8)	50.6 (37.4-62.2)	69.3 (60.9-75.9)	81.5 (68.0-129)	303
Non-Hispanic blacks (2003 - 2004)	21.6 (19.1-24.4)	22.1 (19.6-24.9)	32.3 (28.1-36.2)	43.8 (37.2-57.3)	57.7 (43.8-78.4)	538
Non-Hispanic blacks (2005 - 2006)	18.4 (15.6-21.8)	19.0 (16.7-22.3)	27.6 (24.3-35.5)	45.9 (34.4-58.1)	57.9 (45.0-84.4)	544
Non-Hispanic blacks (2007 - 2008)	15.0 (12.6-17.8)	15.2 (12.9-17.7)	25.8 (21.0-33.3)	42.7 (31.5-57.3)	57.3 (43.4-79.2)	419
Non-Hispanic blacks (2009 - 2010)	9.11 (7.93-10.5)	9.50 (8.20-11.2)	16.0 (13.4-17.4)	23.0 (20.5-26.1)	28.7 (25.7-39.7)	391
Non-Hispanic whites (1999 - 2000)	32.3 (29.5-35.3)	32.8 (29.5-36.0)	45.1 (40.4-47.4)	56.3 (51.7-70.0)	78.0 (58.0-98.4)	519
Non-Hispanic whites (2003 - 2004)	21.4 (19.9-23.1)	22.0 (20.5-23.0)	30.2 (27.7-33.3)	41.7 (35.7-49.6)	56.3 (44.0-70.0)	962
Non-Hispanic whites (2005 - 2006)	18.1 (17.1-19.1)	18.6 (17.3-19.8)	28.3 (26.1-30.8)	39.7 (35.6-43.3)	46.6 (42.7-54.3)	935
Non-Hispanic whites (2007 - 2008)	13.7 (12.7-14.8)	14.3 (13.2-15.5)	21.1 (18.7-23.7)	32.9 (29.7-36.0)	40.4 (36.1-44.9)	931
Non-Hispanic whites (2009 - 2010)	10.2 (8.69-11.9)	10.4 (9.20-11.5)	15.6 (13.0-18.7)	24.7 (17.5-35.1)	33.1 (20.7-56.7)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.4, 0.2, 0.2, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctane sulfonic acid (PFOS) (2011 – 2016)†

CAS Number 1763-23-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	6.31 (5.84-6.82)	6.53 (5.99-7.13)	10.5 (9.78-11.1)	15.7 (14.7-17.5)	21.7 (19.3-23.9)	1904
Total population (2013 - 2014)	4.99 (4.50-5.52)	5.20 (4.80-5.70)	8.70 (7.90-9.40)	13.9 (11.9-15.5)	18.5 (15.4-22.0)	2165
Total population (2015 - 2016)	4.72 (4.40-5.07)	4.80 (4.40-5.30)	8.10 (7.30-9.40)	13.2 (11.4-15.6)	18.3 (15.5-22.7)	1993
Age 12-19 years (2011 - 2012)	4.16 (3.70-4.68)	4.11 (3.48-4.65)	5.90 (5.14-7.25)	9.05 (6.49-10.8)	10.8 (8.52-14.2)	344
Age 12-19 years (2013 - 2014)	3.54 (3.17-3.96)	3.60 (3.10-4.20)	5.20 (4.60-6.20)	7.80 (7.00-8.90)	9.30 (7.90-11.7)	401
Age 12-19 years (2015 - 2016)	2.94 (2.70-3.19)	2.90 (2.70-3.30)	4.30 (3.70-5.00)	6.00 (5.50-6.60)	6.60 (6.10-7.70)	353
Age 20+ years (2011 - 2012)	6.71 (6.24-7.20)	7.07 (6.65-7.52)	11.0 (10.4-11.9)	17.0 (15.3-18.5)	22.7 (20.4-24.8)	1560
Age 20+ years (2013 - 2014)	5.22 (4.70-5.81)	5.60 (5.10-6.00)	9.10 (8.20-10.2)	14.5 (12.9-16.1)	19.5 (15.8-23.0)	1764
Age 20+ years (2015 - 2016)	5.02 (4.64-5.43)	5.20 (4.80-5.70)	8.80 (7.80-10.2)	14.0 (12.2-16.4)	19.1 (15.8-24.4)	1640
Males (2011 - 2012)	7.91 (7.19-8.70)	8.31 (7.35-9.15)	12.5 (11.4-13.5)	19.3 (15.7-21.4)	24.1 (22.2-28.5)	966
Males (2013 - 2014)	6.36 (5.62-7.20)	6.40 (5.70-7.30)	10.2 (8.70-11.5)	15.5 (13.2-19.8)	22.1 (16.7-26.9)	1031
Males (2015 - 2016)	6.16 (5.66-6.70)	6.40 (5.60-6.70)	10.1 (8.90-11.0)	15.6 (13.2-18.8)	21.3 (17.4-24.4)	964
Females (2011 - 2012)	5.10 (4.70-5.53)	5.27 (4.67-5.64)	8.57 (7.87-9.30)	12.5 (11.0-14.9)	17.5 (14.9-20.5)	938
Females (2013 - 2014)	3.96 (3.60-4.35)	4.00 (3.60-4.60)	7.20 (6.40-7.70)	11.8 (9.70-13.6)	15.1 (13.9-17.3)	1134
Females (2015 - 2016)	3.67 (3.34-4.03)	3.60 (3.30-3.90)	6.30 (5.50-7.10)	10.9 (9.10-12.7)	14.6 (12.2-18.3)	1029
Mexican Americans (2011 - 2012)	4.79 (4.07-5.64)	5.18 (3.92-6.33)	7.91 (6.18-9.48)	10.5 (8.50-12.6)	12.1 (10.0-14.4)	211
Mexican Americans (2013 - 2014)	3.47 (2.90-4.16)	3.70 (3.00-4.40)	5.20 (4.60-6.40)	8.80 (6.40-10.3)	10.8 (9.20-11.8)	332
Mexican Americans (2015 - 2016)	3.36 (2.97-3.81)	3.40 (2.80-3.90)	5.80 (4.80-6.60)	8.80 (7.30-9.90)	12.5 (9.50-14.2)	370
Non-Hispanic blacks (2011 - 2012)	6.35 (5.41-7.46)	6.57 (5.71-7.65)	11.3 (9.74-13.9)	21.8 (13.9-31.3)	30.7 (21.6-45.1)	485
Non-Hispanic blacks (2013 - 2014)	5.32 (4.12-6.88)	5.30 (4.30-6.80)	10.2 (7.60-13.7)	17.4 (12.4-24.5)	24.5 (16.3-39.7)	455
Non-Hispanic blacks (2015 - 2016)	4.81 (4.06-5.69)	4.80 (3.90-6.50)	9.70 (8.10-11.2)	17.7 (13.1-22.0)	23.8 (21.8-34.0)	439
Non-Hispanic whites (2011 - 2012)	6.71 (6.15-7.32)	6.83 (6.07-7.73)	10.7 (9.89-12.2)	15.7 (14.8-18.1)	21.3 (18.7-23.5)	666
Non-Hispanic whites (2013 - 2014)	5.31 (4.72-5.98)	5.70 (5.10-6.40)	8.90 (8.20-9.90)	14.1 (12.2-15.6)	18.0 (15.5-20.4)	861
Non-Hispanic whites (2015 - 2016)	4.97 (4.67-5.29)	5.10 (4.60-5.60)	8.30 (7.40-9.90)	13.2 (11.3-15.5)	17.4 (14.2-21.3)	619
All Hispanics (2011 - 2012)	4.63 (3.86-5.55)	5.18 (4.41-6.19)	8.10 (6.64-9.78)	11.0 (9.96-12.6)	13.4 (11.5-16.1)	406
All Hispanics (2013 - 2014)	3.51 (3.09-3.98)	3.70 (3.20-4.20)	5.50 (4.90-6.40)	8.80 (8.00-9.70)	10.8 (9.70-12.1)	537
All Hispanics (2015 - 2016)	3.57 (3.14-4.06)	3.60 (3.00-4.30)	6.30 (5.40-7.10)	9.50 (8.00-11.8)	13.0 (10.5-15.2)	629
Asians (2011 - 2012)	7.10 (5.80-8.68)	7.53 (5.96-9.25)	12.6 (10.8-17.0)	24.6 (19.1-33.3)	35.1 (26.4-42.3)	291
Asians (2013 - 2014)	6.18 (5.08-7.52)	6.30 (5.00-7.90)	13.2 (9.40-15.4)	23.8 (15.2-33.9)	33.6 (20.1-69.0)	234
Asians (2015 - 2016)	5.75 (4.37-7.58)	5.30 (4.20-7.00)	10.5 (7.40-17.6)	25.2 (10.4-52.3)	34.8 (13.9-84.3)	220

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12 is 0.2.

†See [Calculation of PFOS and PFOA as the Sum of Isomers](#) for additional information about Survey years 2013-2014 and 2015-2016.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctane sulfonic acid (PFOS) (2013 – 2014)†

CAS Number 1763-23-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	3.88 (3.53-4.27)	3.75 (3.44-4.17)	5.56 (4.83-6.33)	7.99 (7.02-9.53)	11.0 (9.03-12.4)	639
Age 3-5 years (2013 - 2014)	3.38 (3.04-3.77)	3.41 (2.84-3.78)	4.78 (3.98-6.32)	7.18 (5.50-8.71)	8.82 (7.18-11.0)	181
Age 6-11 years (2013 - 2014)	4.15 (3.76-4.58)	4.02 (3.54-4.45)	5.77 (5.10-6.43)	8.78 (6.75-11.8)	12.4 (9.32-14.1)	458
Males (2013 - 2014)	4.07 (3.56-4.65)	4.13 (3.44-4.76)	6.19 (5.29-7.18)	8.78 (7.18-11.8)	11.8 (8.01-15.4)	343
Females (2013 - 2014)	3.70 (3.38-4.06)	3.54 (3.24-3.96)	4.88 (4.45-5.70)	7.02 (6.33-8.71)	9.44 (7.17-12.0)	296
All Hispanics (2013 - 2014)	3.53 (3.13-3.99)	3.41 (2.95-3.84)	4.71 (4.13-5.65)	7.60 (5.43-9.44)	9.32 (6.50-11.0)	220
Other (2013 - 2014)	4.01 (3.62-4.44)	3.96 (3.44-4.48)	5.97 (5.02-6.49)	8.06 (6.98-11.3)	12.0 (9.10-13.6)	419

†See [Calculation of PFOS and PFOA as the Sum of Isomers](#) for additional information.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum n-Perfluorooctane sulfonic acid (n-PFOS) (2013 – 2016)

CAS Number 1763-23-1

Linear PFOS isomer

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	3.45 (3.10-3.85)	3.50 (3.20-3.90)	6.00 (5.20-6.60)	9.90 (8.50-11.3)	14.0 (11.0-16.7)	2165
Total population (2015 - 2016)	3.20 (2.93-3.49)	3.20 (2.80-3.60)	5.60 (4.90-6.40)	8.90 (7.70-10.4)	12.8 (10.1-17.9)	1993
Age 12-19 years (2013 - 2014)	2.59 (2.29-2.93)	2.70 (2.30-2.90)	3.90 (3.40-4.80)	6.20 (4.80-7.00)	7.10 (6.20-8.60)	401
Age 12-19 years (2015 - 2016)	2.07 (1.90-2.26)	2.00 (1.80-2.40)	3.10 (2.60-3.50)	4.40 (3.80-4.90)	5.10 (4.40-6.60)	353
Age 20+ years (2013 - 2014)	3.59 (3.21-4.02)	3.70 (3.40-4.10)	6.30 (5.50-7.20)	10.3 (9.10-12.3)	15.1 (11.9-17.7)	1764
Age 20+ years (2015 - 2016)	3.38 (3.07-3.73)	3.50 (3.00-3.90)	5.90 (5.20-6.80)	9.20 (8.10-11.1)	13.9 (10.0-19.7)	1640
Males (2013 - 2014)	4.26 (3.74-4.86)	4.20 (3.70-4.80)	6.60 (6.00-7.90)	10.8 (9.30-15.1)	15.4 (12.1-20.2)	1031
Males (2015 - 2016)	4.10 (3.70-4.53)	4.00 (3.50-4.70)	6.80 (5.70-7.60)	10.4 (8.60-12.9)	14.7 (10.5-20.4)	964
Females (2013 - 2014)	2.83 (2.56-3.13)	2.90 (2.60-3.20)	4.90 (4.40-5.60)	8.50 (7.30-9.90)	11.6 (9.90-13.0)	1134
Females (2015 - 2016)	2.53 (2.28-2.80)	2.50 (2.30-2.70)	4.30 (3.80-5.00)	7.50 (6.00-8.50)	10.1 (8.10-14.2)	1029
Mexican Americans (2013 - 2014)	2.38 (1.99-2.84)	2.40 (2.10-2.80)	3.50 (3.00-3.90)	6.10 (3.90-8.00)	7.90 (6.20-8.90)	332
Mexican Americans (2015 - 2016)	2.31 (2.01-2.65)	2.30 (2.00-2.60)	3.70 (3.00-4.80)	6.10 (5.10-7.70)	8.20 (6.80-9.40)	370
Non-Hispanic blacks (2013 - 2014)	4.02 (3.03-5.34)	4.00 (3.00-5.50)	7.50 (5.30-10.9)	14.4 (9.00-20.3)	19.3 (14.4-32.6)	455
Non-Hispanic blacks (2015 - 2016)	3.47 (2.87-4.19)	3.40 (2.70-4.60)	6.70 (5.30-8.70)	12.3 (9.20-16.5)	19.4 (14.4-27.0)	439
Non-Hispanic whites (2013 - 2014)	3.58 (3.17-4.06)	3.70 (3.40-4.20)	6.10 (5.40-6.70)	10.0 (8.60-11.0)	13.0 (10.8-15.1)	861
Non-Hispanic whites (2015 - 2016)	3.29 (3.04-3.55)	3.40 (2.90-3.70)	5.70 (4.90-6.50)	8.60 (7.60-10.1)	11.4 (9.20-14.7)	619
All Hispanics (2013 - 2014)	2.43 (2.14-2.76)	2.50 (2.10-2.80)	3.90 (3.30-4.50)	6.20 (4.90-7.60)	8.00 (7.10-8.80)	537
All Hispanics (2015 - 2016)	2.47 (2.15-2.84)	2.50 (2.10-2.90)	4.20 (3.50-5.00)	6.80 (5.30-8.50)	9.20 (7.60-10.3)	629
Asians (2013 - 2014)	4.79 (3.83-5.99)	4.60 (4.00-6.20)	9.90 (8.00-12.5)	19.2 (12.4-32.5)	31.1 (17.0-64.8)	234
Asians (2015 - 2016)	4.26 (3.15-5.77)	3.80 (2.80-5.30)	8.70 (5.30-15.6)	21.1 (8.60-47.5)	31.1 (10.9-77.9)	220

Limit of detection (LOD, see Data Analysis section) for Survey years 13-14 and 15-16 are 0.1 and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum n-Perfluorooctane sulfonic acid (n-PFOS) (2013 – 2014)

CAS Number 1763-23-1

Linear PFOS isomer

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	2.51 (2.30-2.74)	2.47 (2.17-2.73)	3.57 (3.10-4.08)	5.60 (4.50-6.34)	7.72 (5.75-8.68)	639
Age 3-5 years (2013 - 2014)	2.22 (2.01-2.46)	2.11 (1.74-2.33)	3.28 (2.69-4.15)	5.52 (3.95-6.34)	6.19 (5.72-7.72)	181
Age 6-11 years (2013 - 2014)	2.67 (2.43-2.92)	2.65 (2.38-2.78)	3.72 (3.20-4.11)	5.62 (4.52-7.75)	8.41 (5.91-9.54)	458
Males (2013 - 2014)	2.67 (2.33-3.06)	2.67 (2.20-2.93)	4.14 (3.51-4.52)	5.74 (4.36-8.37)	8.83 (5.74-10.3)	343
Females (2013 - 2014)	2.36 (2.19-2.54)	2.24 (2.03-2.48)	3.07 (2.84-3.33)	4.97 (4.02-5.55)	6.08 (5.18-7.72)	296
All Hispanics (2013 - 2014)	2.29 (2.00-2.61)	2.18 (1.93-2.51)	3.07 (2.73-3.80)	4.96 (3.52-6.51)	5.94 (4.29-9.62)	220
Other (2013 - 2014)	2.59 (2.35-2.85)	2.55 (2.19-2.78)	3.82 (3.09-4.25)	5.71 (4.50-7.14)	7.75 (5.74-9.04)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum branched Perfluoromethylheptane sulfonic acid (Sm-PFOS) (2013 – 2016)

CAS Number 1763-23-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	1.39 (1.25-1.55)	1.50 (1.40-1.60)	2.70 (2.50-2.90)	4.00 (3.60-4.50)	5.10 (4.60-5.80)	2165
Total population (2015 - 2016)	1.42 (1.32-1.52)	1.50 (1.40-1.60)	2.60 (2.40-2.90)	4.40 (4.00-4.90)	5.70 (5.10-6.30)	1993
Age 12-19 years (2013 - 2014)	.897 (.800-1.01)	1.00 (.800-1.10)	1.40 (1.20-1.50)	1.90 (1.50-2.10)	2.30 (1.80-3.00)	401
Age 12-19 years (2015 - 2016)	.819 (.715-.939)	.900 (.700-1.00)	1.20 (1.00-1.40)	1.60 (1.30-2.00)	2.00 (1.50-2.40)	353
Age 20+ years (2013 - 2014)	1.47 (1.32-1.65)	1.60 (1.50-1.80)	2.90 (2.60-3.10)	4.20 (3.70-4.70)	5.30 (4.70-6.00)	1764
Age 20+ years (2015 - 2016)	1.52 (1.42-1.62)	1.60 (1.50-1.80)	2.90 (2.60-3.10)	4.70 (4.20-5.10)	5.90 (5.30-6.70)	1640
Males (2013 - 2014)	1.94 (1.72-2.19)	2.10 (1.80-2.40)	3.20 (2.90-3.60)	4.60 (4.00-5.60)	5.90 (4.90-7.00)	1031
Males (2015 - 2016)	1.94 (1.77-2.12)	2.00 (1.80-2.20)	3.30 (3.10-3.60)	5.10 (4.40-5.40)	6.30 (5.40-7.10)	964
Females (2013 - 2014)	1.01 (.914-1.12)	1.10 (.900-1.20)	1.90 (1.70-2.10)	3.30 (3.00-3.60)	4.20 (3.70-4.70)	1134
Females (2015 - 2016)	1.05 (.967-1.14)	1.00 (.900-1.10)	1.90 (1.70-2.10)	3.50 (2.70-4.30)	4.80 (3.90-5.90)	1029
Mexican Americans (2013 - 2014)	1.00 (.823-1.23)	1.10 (.900-1.30)	1.70 (1.50-2.20)	2.70 (2.20-3.20)	3.70 (2.90-4.20)	332
Mexican Americans (2015 - 2016)	1.00 (.892-1.13)	1.00 (.900-1.20)	1.80 (1.50-2.00)	2.80 (2.40-3.20)	3.70 (3.10-4.40)	370
Non-Hispanic blacks (2013 - 2014)	1.15 (.942-1.40)	1.20 (1.00-1.50)	2.40 (1.90-3.00)	4.40 (3.40-5.20)	5.50 (4.50-7.00)	455
Non-Hispanic blacks (2015 - 2016)	1.23 (1.06-1.42)	1.30 (1.10-1.70)	2.80 (2.30-3.30)	4.60 (3.80-5.40)	6.10 (5.40-7.10)	439
Non-Hispanic whites (2013 - 2014)	1.61 (1.41-1.82)	1.70 (1.50-2.00)	3.00 (2.70-3.20)	4.20 (3.70-4.90)	5.50 (4.80-6.00)	861
Non-Hispanic whites (2015 - 2016)	1.59 (1.47-1.71)	1.60 (1.50-1.80)	3.00 (2.60-3.20)	4.80 (4.30-5.20)	6.00 (5.20-6.90)	619
All Hispanics (2013 - 2014)	.987 (.859-1.13)	1.00 (.900-1.20)	1.80 (1.60-2.10)	2.70 (2.40-3.20)	3.50 (2.90-4.00)	537
All Hispanics (2015 - 2016)	1.05 (.930-1.18)	1.10 (1.00-1.20)	2.00 (1.60-2.30)	3.00 (2.70-3.30)	3.80 (3.30-4.40)	629
Asians (2013 - 2014)	1.10 (.955-1.28)	1.20 (1.00-1.40)	2.30 (1.60-2.70)	3.50 (2.50-4.50)	4.40 (3.50-7.20)	234
Asians (2015 - 2016)	1.23 (1.03-1.47)	1.30 (1.10-1.40)	2.20 (1.60-3.00)	3.90 (2.60-5.80)	5.10 (3.10-9.80)	220

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.1 and 0.1 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum branched Perfluoromethylheptane sulfonic acid (Sm-PFOS) (2013 – 2014)

CAS Number 1763-23-1

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	1.23 (1.09-1.40)	1.28 (1.05-1.45)	1.90 (1.64-2.21)	3.02 (2.57-3.92)	4.07 (3.23-4.78)	639
Age 3-5 years (2013 - 2014)	1.03 (.874-1.21)	1.00 (.820-1.32)	1.65 (1.40-2.14)	2.63 (2.14-3.23)	3.60 (2.21-4.23)	181
Age 6-11 years (2013 - 2014)	1.35 (1.19-1.52)	1.41 (1.19-1.51)	2.03 (1.74-2.48)	3.32 (2.59-4.10)	4.25 (3.26-6.00)	458
Males (2013 - 2014)	1.26 (1.08-1.48)	1.31 (1.04-1.46)	2.07 (1.67-2.56)	3.44 (2.56-4.25)	4.25 (3.02-5.55)	343
Females (2013 - 2014)	1.20 (1.04-1.39)	1.22 (1.03-1.48)	1.79 (1.53-2.25)	2.90 (2.18-3.60)	3.60 (2.54-5.28)	296
All Hispanics (2013 - 2014)	1.13 (.997-1.27)	1.12 (.990-1.33)	1.67 (1.45-1.89)	2.28 (1.93-2.94)	3.14 (2.21-3.63)	220
Other (2013 - 2014)	1.27 (1.11-1.46)	1.32 (1.13-1.49)	2.05 (1.66-2.48)	3.48 (2.65-4.10)	4.23 (3.60-5.28)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctane sulfonamide (PFOSA or FOSA) (1999 – 2010)

CAS Number 754-91-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.355 (.296-.426)	.400 (.300-.400)	.700 (.500-.800)	1.00 (.900-1.40)	1.40 (1.00-2.00)	1562
Total population (2003 - 2004)	*	.100 (.100-.100)	.100 (.100-.100)	.300 (.200-.300)	.300 (.300-.400)	2094
Total population (2005 - 2006)	*	< LOD	.100 (<LOD-.200)	.200 (.200-.300)	.300 (.200-.500)	2120
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2100
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2233
Age 12-19 years (1999 - 2000)	.429 (.370-.498)	.400 (.400-.500)	.700 (.700-.900)	1.10 (.900-1.40)	1.60 (1.10-2.90)	543
Age 12-19 years (2003 - 2004)	*	.100 (.100-.100)	.100 (.100-.200)	.300 (.200-.300)	.300 (.200-.500)	640
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.200 (.100-.300)	.300 (.200-.500)	640
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	357
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	364
Age 20+ years (1999 - 2000)	.344 (.283-.418)	.300 (.300-.400)	.600 (.500-.800)	1.00 (.800-1.40)	1.40 (1.00-2.00)	1019
Age 20+ years (2003 - 2004)	*	.100 (.100-.100)	.100 (.100-.100)	.300 (.200-.300)	.300 (.300-.400)	1454
Age 20+ years (2005 - 2006)	*	< LOD	.100 (<LOD-.200)	.200 (.200-.300)	.300 (.200-.500)	1480
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1743
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1869
Males (1999 - 2000)	.351 (.289-.426)	.400 (.300-.400)	.600 (.500-.700)	.900 (.700-1.30)	1.30 (.900-1.90)	743
Males (2003 - 2004)	*	.100 (.100-.100)	.100 (.100-.100)	.300 (.200-.300)	.300 (.200-.500)	1053
Males (2005 - 2006)	*	< LOD	.100 (.100-.200)	.200 (.200-.300)	.300 (.200-.600)	1048
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1059
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1075
Females (1999 - 2000)	.358 (.298-.431)	.300 (.300-.500)	.700 (.500-.900)	1.10 (.900-1.40)	1.50 (1.20-2.00)	819
Females (2003 - 2004)	*	.100 (.100-.100)	.100 (.100-.200)	.300 (.200-.300)	.300 (.300-.500)	1041
Females (2005 - 2006)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.400)	1072
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1041
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.05, 0.1, 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctane sulfonamide (PFOSA or FOSA) (1999 – 2010)

CAS Number 754-91-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.285 (.245-.332)	.300 (.200-.400)	.500 (.400-.600)	.800 (.700-1.00)	1.10 (.800-1.60)	584
Mexican Americans (2003 - 2004)	*	.100 (.100-.100)	.100 (.100-.100)	.100 (.100-.100)	.200 (.100-.300)	485
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.200 (<LOD-.300)	.200 (<LOD-5.00)	499
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	391
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	461
Non-Hispanic blacks (1999 - 2000)	.347 (.289-.417)	.300 (.300-.400)	.600 (.500-.800)	1.00 (.700-1.70)	1.70 (.900-2.60)	303
Non-Hispanic blacks (2003 - 2004)	*	.100 (.100-.100)	.100 (.100-.200)	.300 (.200-.300)	.300 (.200-.500)	538
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.400)	544
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	419
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	391
Non-Hispanic whites (1999 - 2000)	.382 (.305-.479)	.400 (.300-.500)	.700 (.600-.900)	1.10 (.900-1.40)	1.50 (1.10-2.00)	519
Non-Hispanic whites (2003 - 2004)	*	.100 (.100-.100)	.100 (.100-.200)	.300 (.200-.300)	.300 (.300-.500)	962
Non-Hispanic whites (2005 - 2006)	*	< LOD	.100 (.100-.200)	.200 (.200-.300)	.300 (.200-.500)	935
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	931
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.05, 0.1, 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctane sulfonamide (PFOSA or FOSA) (2011 – 2012)‡

CAS Number 754-91-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1904
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	344
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1560
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	966
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	938
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	211
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	485
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	666
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	406
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluorooctane sulfonamide (PFOSA or FOSA) (2013 – 2014)

CAS Number 754-91-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	639
Age 3-5 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.110 (<LOD-.170)	181
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	458
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	343
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	296
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	220
Other (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum 2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA) (1999 – 2010)

CAS Number 2991-50-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.642 (.596-.691)	.600 (.500-.700)	1.10 (1.00-1.20)	1.60 (1.50-1.80)	2.30 (1.90-2.70)	1562
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2094
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	.300 (<LOD-.300)	2120
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2100
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	.100 (<LOD-.100)	2233
Age 12-19 years (1999 - 2000)	.826 (.764-.893)	.800 (.700-.800)	1.20 (1.10-1.30)	1.70 (1.50-2.00)	2.40 (1.90-3.30)	543
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	640
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	.200 (<LOD-.400)	640
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	357
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	364
Age 20+ years (1999 - 2000)	.614 (.569-.663)	.600 (.500-.700)	1.00 (.900-1.10)	1.60 (1.50-1.80)	2.30 (1.80-2.70)	1019
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1454
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	.300 (<LOD-.300)	1480
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1743
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	.100 (<LOD-.100)	1869
Males (1999 - 2000)	.619 (.572-.671)	.600 (.500-.700)	1.00 (.900-1.10)	1.50 (1.30-1.80)	1.90 (1.60-2.90)	743
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1053
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	.300 (.200-.300)	1048
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1059
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	.100 (<LOD-.100)	1075
Females (1999 - 2000)	.662 (.599-.732)	.700 (.500-.700)	1.10 (1.00-1.20)	1.70 (1.50-2.20)	2.50 (2.00-2.80)	819
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1041
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	.300 (<LOD-.300)	1072
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1041
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	.100 (<LOD-.100)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.4, 0.2, 0.2, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum 2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA (1999 – 2010))

CAS Number 2991-50-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.577 (.477-.698)	.600 (.400-.700)	1.00 (.800-1.20)	1.70 (1.30-2.00)	2.50 (1.90-3.00)	584
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	485
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	499
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	391
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	461
Non-Hispanic blacks (1999 - 2000)	.555 (.476-.646)	.500 (.500-.600)	.900 (.700-1.00)	1.50 (1.20-1.90)	2.20 (1.40-3.20)	303
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	.400 (<LOD-.500)	538
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	544
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	419
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	391
Non-Hispanic whites (1999 - 2000)	.660 (.606-.717)	.700 (.600-.700)	1.10 (1.00-1.20)	1.70 (1.50-1.90)	2.40 (1.90-2.80)	519
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	962
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	.300 (.200-.400)	935
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	931
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	.100 (<LOD-.200)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.4, 0.2, 0.2, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum 2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA) (2011 – 2012)‡

CAS Number 2991-50-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	.110 (<LOD-.130)	1904
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	344
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	.110 (<LOD-.150)	1560
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	.110 (<LOD-.140)	966
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	.100 (<LOD-.130)	938
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	.100 (<LOD-.160)	211
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	485
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	.120 (<LOD-.140)	666
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	406
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	.110 (<LOD-.200)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum 2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA) (2013 – 2014)

CAS Number 2991-50-6

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	639
Age 3-5 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	181
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	458
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	.100 (<LOD-.140)	343
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	296
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	220
Other (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum 2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA) (1999 – 2010)

CAS Number 2355-31-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	.846 (.738-.970)	.870 (.780-.960)	1.40 (1.13-1.66)	2.18 (1.83-2.62)	2.79 (2.44-3.23)	1562
Total population (2003 - 2004)	*	< LOD	.610 (<LOD-.610)	.870 (.780-.960)	1.13 (.960-1.31)	2094
Total population (2005 - 2006)	.410 (.372-.451)	.440 (.350-.440)	.700 (.610-.780)	1.22 (1.13-1.22)	1.57 (1.48-1.74)	2120
Total population (2007 - 2008)	.303 (.277-.330)	.300 (.300-.300)	.500 (.400-.600)	1.00 (.800-1.00)	1.30 (1.20-1.40)	2100
Total population (2009 - 2010)	.198 (.184-.213)	.200 (.200-.200)	.300 (.300-.300)	.700 (.600-.700)	1.00 (.900-1.00)	2233
Age 12-19 years (1999 - 2000)	1.17 (1.03-1.34)	1.22 (1.05-1.31)	1.83 (1.31-2.18)	2.70 (2.18-3.05)	3.23 (2.79-4.10)	543
Age 12-19 years (2003 - 2004)	*	< LOD	.610 (<LOD-.700)	.960 (.780-1.13)	1.31 (1.05-1.57)	640
Age 12-19 years (2005 - 2006)	.432 (.380-.490)	.440 (.350-.520)	.780 (.610-.870)	1.13 (.960-1.31)	1.48 (1.13-1.66)	640
Age 12-19 years (2007 - 2008)	.340 (.305-.379)	.300 (.300-.400)	.600 (.500-.600)	1.00 (.800-1.50)	1.60 (1.00-2.00)	357
Age 12-19 years (2009 - 2010)	.235 (.203-.273)	.300 (.200-.300)	.400 (.300-.500)	.700 (.500-.900)	.900 (.600-1.70)	364
Age 20+ years (1999 - 2000)	.800 (.693-.923)	.780 (.700-.960)	1.31 (1.13-1.57)	2.09 (1.74-2.44)	2.70 (2.27-3.14)	1019
Age 20+ years (2003 - 2004)	*	< LOD	.610 (<LOD-.610)	.870 (.780-.960)	1.05 (.960-1.40)	1454
Age 20+ years (2005 - 2006)	.406 (.369-.448)	.440 (.350-.440)	.700 (.610-.780)	1.22 (1.13-1.31)	1.66 (1.48-1.74)	1480
Age 20+ years (2007 - 2008)	.297 (.270-.327)	.300 (.300-.300)	.500 (.400-.600)	1.00 (.800-1.00)	1.20 (1.10-1.40)	1743
Age 20+ years (2009 - 2010)	.193 (.178-.210)	.200 (.200-.200)	.300 (.300-.300)	.700 (.600-.800)	1.00 (.900-1.00)	1869
Males (1999 - 2000)	.885 (.756-1.04)	.870 (.780-1.05)	1.40 (1.13-1.74)	2.27 (2.01-2.79)	2.79 (2.44-3.66)	743
Males (2003 - 2004)	*	< LOD	.610 (<LOD-.610)	.960 (.780-1.05)	1.13 (.960-1.48)	1053
Males (2005 - 2006)	.435 (.400-.472)	.440 (.350-.440)	.780 (.700-.870)	1.22 (1.13-1.31)	1.66 (1.40-1.74)	1048
Males (2007 - 2008)	.307 (.281-.334)	.300 (.300-.300)	.500 (.400-.600)	.900 (.800-1.00)	1.30 (1.10-1.40)	1059
Males (2009 - 2010)	.200 (.187-.214)	.200 (.200-.200)	.300 (.300-.400)	.700 (.600-.800)	1.00 (.800-1.10)	1075
Females (1999 - 2000)	.813 (.717-.923)	.780 (.700-.960)	1.31 (1.13-1.66)	2.01 (1.74-2.35)	2.62 (2.27-3.23)	819
Females (2003 - 2004)	*	< LOD	< LOD	.870 (.780-.960)	.960 (.870-1.57)	1041
Females (2005 - 2006)	.387 (.342-.438)	.350 (.350-.440)	.700 (.610-.780)	1.13 (1.05-1.31)	1.57 (1.40-1.83)	1072
Females (2007 - 2008)	.299 (.267-.334)	.300 (.300-.300)	.500 (.400-.600)	1.00 (.800-1.10)	1.30 (1.10-1.70)	1041
Females (2009 - 2010)	.196 (.178-.216)	.200 (.200-.200)	.300 (.300-.300)	.600 (.500-.800)	1.00 (.800-1.00)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.174, 0.523, 0.174, 0.174, and 0.087 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum 2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA) (1999 – 2010)

CAS Number 2355-31-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	.668 (.545-.817)	.700 (.520-.780)	1.13 (.870-1.31)	1.83 (1.40-2.35)	2.35 (1.74-3.92)	584
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.610 (<LOD-.780)	.780 (<LOD-1.13)	485
Mexican Americans (2005 - 2006)	.292 (.245-.348)	.260 (.260-.350)	.440 (.350-.700)	.780 (.610-1.05)	1.05 (.870-1.22)	499
Mexican Americans (2007 - 2008)	*	.200 (<LOD-.200)	.300 (.300-.300)	.500 (.400-.800)	.800 (.500-1.10)	391
Mexican Americans (2009 - 2010)	.139 (.118-.163)	.100 (.100-.200)	.300 (.200-.300)	.500 (.400-.600)	.700 (.500-1.00)	461
Non-Hispanic blacks (1999 - 2000)	.989 (.853-1.15)	1.05 (.780-1.22)	1.57 (1.31-1.83)	2.35 (1.92-2.79)	3.14 (2.27-4.27)	303
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.700 (<LOD-.780)	.960 (.780-1.22)	1.31 (.960-1.57)	538
Non-Hispanic blacks (2005 - 2006)	.418 (.361-.486)	.440 (.350-.520)	.700 (.610-.870)	1.22 (1.05-1.48)	1.66 (1.48-2.01)	544
Non-Hispanic blacks (2007 - 2008)	.330 (.304-.357)	.300 (.300-.300)	.500 (.500-.700)	1.00 (.800-1.20)	1.40 (1.20-1.70)	419
Non-Hispanic blacks (2009 - 2010)	.193 (.166-.225)	.200 (.200-.200)	.300 (.300-.400)	.600 (.400-.800)	.900 (.600-1.10)	391
Non-Hispanic whites (1999 - 2000)	.883 (.758-1.03)	.870 (.780-1.05)	1.40 (1.22-1.74)	2.18 (1.92-2.70)	2.79 (2.44-3.66)	519
Non-Hispanic whites (2003 - 2004)	*	< LOD	.610 (<LOD-.700)	.870 (.780-.960)	1.13 (.960-1.40)	962
Non-Hispanic whites (2005 - 2006)	.428 (.380-.483)	.440 (.350-.520)	.780 (.700-.870)	1.22 (1.13-1.31)	1.66 (1.40-1.83)	935
Non-Hispanic whites (2007 - 2008)	.332 (.296-.372)	.300 (.300-.300)	.600 (.500-.700)	1.00 (.800-1.10)	1.30 (1.10-1.60)	931
Non-Hispanic whites (2009 - 2010)	.216 (.201-.232)	.200 (.200-.300)	.300 (.300-.400)	.700 (.600-.800)	1.00 (.900-1.10)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.174, 0.523, 0.174, 0.174, and 0.087 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum 2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA) (2011 – 2016)

CAS Number 2355-31-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	.100 (<LOD-.160)	.250 (.200-.310)	.500 (.440-.530)	.690 (.580-.850)	1904
Total population (2013 - 2014)	*	< LOD	.200 (.200-.200)	.400 (.300-.500)	.600 (.500-.900)	2168
Total population (2015 - 2016)	*	< LOD	.200 (.100-.200)	.400 (.300-.400)	.600 (.500-.800)	1993
Age 12-19 years (2011 - 2012)	.134 (.110-.163)	.110 (.090-.170)	.260 (.170-.350)	.420 (.350-.480)	.510 (.420-.850)	344
Age 12-19 years (2013 - 2014)	*	.100 (<LOD-.100)	.200 (.200-.300)	.500 (.400-.500)	.600 (.500-.900)	402
Age 12-19 years (2015 - 2016)	*	< LOD	.200 (.100-.300)	.300 (.200-.600)	.600 (.300-1.30)	353
Age 20+ years (2011 - 2012)	*	.100 (<LOD-.160)	.250 (.200-.310)	.510 (.460-.550)	.700 (.640-.840)	1560
Age 20+ years (2013 - 2014)	*	< LOD	.200 (.200-.200)	.400 (.300-.500)	.600 (.500-1.00)	1766
Age 20+ years (2015 - 2016)	*	< LOD	.200 (.100-.200)	.400 (.300-.500)	.600 (.500-.700)	1640
Males (2011 - 2012)	*	.110 (<LOD-.160)	.270 (.190-.350)	.490 (.390-.660)	.720 (.510-1.06)	966
Males (2013 - 2014)	*	< LOD	.200 (.200-.200)	.400 (.300-.500)	.600 (.400-.900)	1032
Males (2015 - 2016)	*	< LOD	.200 (.100-.200)	.400 (.300-.500)	.600 (.500-.800)	964
Females (2011 - 2012)	*	.100 (<LOD-.160)	.250 (.200-.300)	.510 (.410-.540)	.690 (.560-.810)	938
Females (2013 - 2014)	*	< LOD	.200 (.200-.200)	.400 (.300-.600)	.700 (.500-1.10)	1136
Females (2015 - 2016)	*	< LOD	.200 (.100-.200)	.400 (.300-.400)	.500 (.400-.800)	1029
Mexican Americans (2011 - 2012)	*	< LOD	.220 (.160-.310)	.440 (.310-.590)	.590 (.390-.970)	211
Mexican Americans (2013 - 2014)	*	< LOD	.100 (<LOD-.100)	.200 (.100-.500)	.500 (.300-.500)	332
Mexican Americans (2015 - 2016)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.400)	370
Non-Hispanic blacks (2011 - 2012)	*	.100 (<LOD-.150)	.240 (.170-.340)	.520 (.390-.660)	.780 (.580-1.06)	485
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.200 (.100-.300)	.400 (.200-1.00)	.800 (.400-1.60)	455
Non-Hispanic blacks (2015 - 2016)	*	< LOD	.200 (.100-.200)	.300 (.200-.400)	.600 (.400-.700)	439
Non-Hispanic whites (2011 - 2012)	*	.120 (<LOD-.170)	.280 (.230-.340)	.510 (.460-.580)	.700 (.600-.990)	666
Non-Hispanic whites (2013 - 2014)	*	.100 (<LOD-.100)	.200 (.200-.300)	.500 (.400-.500)	.700 (.500-1.00)	862
Non-Hispanic whites (2015 - 2016)	*	< LOD	.200 (.200-.200)	.400 (.400-.600)	.700 (.600-.800)	619
All Hispanics (2011 - 2012)	*	< LOD	.170 (.130-.230)	.350 (.260-.450)	.510 (.380-.740)	406
All Hispanics (2013 - 2014)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.500)	537
All Hispanics (2015 - 2016)	*	< LOD	.100 (<LOD-.100)	.200 (.200-.300)	.300 (.200-.400)	629
Asians (2011 - 2012)	*	< LOD	.170 (.130-.260)	.370 (.300-.520)	.580 (.420-.860)	291
Asians (2013 - 2014)	*	< LOD	.100 (<LOD-.200)	.200 (.100-.400)	.400 (.200-.600)	236
Asians (2015 - 2016)	*	< LOD	.100 (<LOD-.200)	.200 (.100-.400)	.400 (.200-.600)	220

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.087, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum 2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA) (2013 – 2014)

CAS Number 2355-31-9

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	.110 (<LOD-.150)	.260 (.190-.390)	.650 (.360-1.02)	1.02 (.650-1.81)	639
Age 3-5 years (2013 - 2014)	*	.110 (<LOD-.190)	.240 (.170-.550)	.880 (.250-1.81)	1.02 (.530-3.15)	181
Age 6-11 years (2013 - 2014)	*	.110 (<LOD-.140)	.270 (.180-.370)	.570 (.350-.940)	.940 (.570-1.92)	458
Males (2013 - 2014)	*	.100 (<LOD-.170)	.270 (.180-.480)	.870 (.360-1.37)	1.14 (.690-1.99)	343
Females (2013 - 2014)	*	.120 (<LOD-.140)	.260 (.180-.360)	.490 (.290-.860)	.810 (.590-.970)	296
All Hispanics (2013 - 2014)	*	< LOD	.160 (.100-.280)	.440 (.250-.650)	.650 (.440-1.02)	220
Other (2013 - 2014)	*	.130 (<LOD-.190)	.280 (.220-.420)	.810 (.400-1.04)	1.14 (.860-1.99)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluoroundecanoic acid (PFUnDA) (1999 – 2010)

CAS Number 2058-94-8

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	.300 (<LOD-.400)	.400 (.300-.700)	1562
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.600 (<LOD-1.30)	2094
Total population (2005 - 2006)	*	< LOD	.300 (.200-.400)	.500 (.400-.800)	.700 (.600-1.20)	2120
Total population (2007 - 2008)	*	< LOD	.200 (<LOD-.300)	.400 (.300-.500)	.600 (.500-.800)	2100
Total population (2009 - 2010)	.172 (.151-.196)	.200 (.100-.200)	.300 (.200-.400)	.600 (.400-.800)	.900 (.600-1.10)	2233
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	.200 (<LOD-.300)	543
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	.300 (<LOD-1.10)	640
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.300 (.200-.500)	.500 (.300-.900)	640
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.200 (<LOD-.200)	.300 (.200-.300)	357
Age 12-19 years (2009 - 2010)	*	.100 (<LOD-.100)	.200 (.100-.200)	.300 (.200-.600)	.400 (.200-.900)	364
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	.300 (<LOD-.500)	.500 (.300-.700)	1019
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	.300 (<LOD-.600)	.600 (<LOD-1.40)	1454
Age 20+ years (2005 - 2006)	*	< LOD	.300 (.200-.400)	.500 (.400-.800)	.800 (.600-1.10)	1480
Age 20+ years (2007 - 2008)	*	< LOD	.200 (.200-.300)	.400 (.300-.600)	.600 (.500-.900)	1743
Age 20+ years (2009 - 2010)	.182 (.160-.207)	.200 (.200-.200)	.300 (.300-.400)	.600 (.400-.800)	.900 (.700-1.20)	1869
Males (1999 - 2000)	*	< LOD	< LOD	.300 (<LOD-.500)	.500 (.300-.600)	743
Males (2003 - 2004)	*	< LOD	< LOD	.400 (<LOD-1.00)	.700 (<LOD-2.30)	1053
Males (2005 - 2006)	*	< LOD	.300 (.200-.400)	.600 (.400-.700)	.800 (.600-1.10)	1048
Males (2007 - 2008)	*	< LOD	.200 (<LOD-.300)	.400 (.300-.500)	.700 (.500-1.00)	1059
Males (2009 - 2010)	.170 (.147-.196)	.200 (.100-.200)	.300 (.200-.400)	.500 (.400-.900)	.800 (.500-1.20)	1075
Females (1999 - 2000)	*	< LOD	< LOD	.300 (<LOD-.400)	.400 (.200-.800)	819
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	.400 (<LOD-.700)	1041
Females (2005 - 2006)	*	< LOD	.300 (<LOD-.400)	.500 (.400-.700)	.700 (.500-1.10)	1072
Females (2007 - 2008)	*	< LOD	.200 (<LOD-.200)	.400 (.300-.500)	.600 (.400-.700)	1041
Females (2009 - 2010)	.175 (.153-.199)	.200 (.100-.200)	.300 (.200-.400)	.600 (.400-.800)	.900 (.700-1.20)	1158

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.3, 0.2, 0.2, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluoroundecanoic acid (PFUnDA) (1999 – 2010)

CAS Number 2058-94-8

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	584
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	485
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.300 (<LOD-.700)	.500 (.300-1.00)	499
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.300 (<LOD-.400)	.300 (<LOD-1.40)	391
Mexican Americans (2009 - 2010)	*	.100 (.100-.100)	.200 (.200-.200)	.300 (.300-.400)	.400 (.300-.600)	461
Non-Hispanic blacks (1999 - 2000)	*	< LOD	.300 (<LOD-.500)	.600 (.300-1.00)	.900 (.600-1.80)	303
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	.600 (<LOD-1.40)	.900 (.300-2.90)	538
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.300 (<LOD-.500)	.600 (.400-1.50)	1.20 (.600-2.70)	544
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.300 (.200-.400)	.500 (.400-.700)	.800 (.600-1.20)	419
Non-Hispanic blacks (2009 - 2010)	.237 (.199-.283)	.200 (.200-.200)	.400 (.300-.500)	.800 (.500-1.10)	1.30 (.800-1.80)	391
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	.200 (<LOD-.300)	.300 (<LOD-.800)	519
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.500 (<LOD-.900)	962
Non-Hispanic whites (2005 - 2006)	*	< LOD	.300 (.200-.400)	.500 (.400-.700)	.600 (.400-1.50)	935
Non-Hispanic whites (2007 - 2008)	*	< LOD	.200 (<LOD-.200)	.300 (.300-.500)	.500 (.400-.600)	931
Non-Hispanic whites (2009 - 2010)	.162 (.136-.193)	.200 (.100-.200)	.300 (.200-.400)	.500 (.300-.800)	.800 (.500-1.00)	1031

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.3, 0.2, 0.2, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluoroundecanoic acid (PFUnDA) (2011 – 2016)

CAS Number 2058-94-8

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	.120 (.100-.140)	.220 (.180-.250)	.380 (.310-.520)	.620 (.440-.790)	1904
Total population (2013 - 2014)	*	< LOD	.200 (.100-.200)	.300 (.200-.400)	.500 (.400-.600)	2168
Total population (2015 - 2016)	*	< LOD	.100 (.100-.200)	.200 (.200-.500)	.400 (.300-.500)	1993
Age 12-19 years (2011 - 2012)	*	< LOD	.110 (<LOD-.140)	.180 (.140-.220)	.250 (.190-.390)	344
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.200 (.100-.200)	.200 (.200-.300)	402
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.400)	353
Age 20+ years (2011 - 2012)	.146 (.129-.165)	.130 (.110-.150)	.230 (.190-.280)	.420 (.330-.530)	.660 (.490-.840)	1560
Age 20+ years (2013 - 2014)	*	< LOD	.200 (.100-.200)	.300 (.300-.500)	.500 (.400-.700)	1766
Age 20+ years (2015 - 2016)	*	< LOD	.100 (.100-.200)	.300 (.200-.300)	.400 (.300-.500)	1640
Males (2011 - 2012)	*	.120 (.100-.150)	.220 (.180-.260)	.340 (.290-.480)	.590 (.390-.820)	966
Males (2013 - 2014)	*	< LOD	.200 (.100-.200)	.300 (.200-.500)	.500 (.400-.700)	1032
Males (2015 - 2016)	*	< LOD	.100 (.100-.200)	.200 (.200-.500)	.400 (.300-.500)	964
Females (2011 - 2012)	*	.120 (.100-.140)	.210 (.180-.270)	.420 (.320-.540)	.650 (.520-.740)	938
Females (2013 - 2014)	*	< LOD	.200 (.100-.200)	.300 (.200-.400)	.500 (.400-.600)	1136
Females (2015 - 2016)	*	< LOD	.100 (.100-.200)	.200 (.200-.500)	.400 (.300-.500)	1029
Mexican Americans (2011 - 2012)	*	< LOD	.150 (.130-.180)	.230 (.190-.300)	.310 (.230-.330)	211
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.200 (.100-.300)	.200 (.100-.600)	332
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	.100 (<LOD-.200)	.200 (.100-.400)	370
Non-Hispanic blacks (2011 - 2012)	.164 (.135-.199)	.140 (.110-.190)	.260 (.200-.390)	.530 (.350-.840)	.840 (.520-1.26)	485
Non-Hispanic blacks (2013 - 2014)	*	.100 (<LOD-.200)	.200 (.100-.400)	.500 (.300-.700)	.700 (.500-.900)	455
Non-Hispanic blacks (2015 - 2016)	*	< LOD	.200 (.100-.200)	.300 (.200-.400)	.400 (.300-.700)	439
Non-Hispanic whites (2011 - 2012)	*	.110 (<LOD-.140)	.200 (.160-.240)	.330 (.280-.410)	.450 (.330-.690)	666
Non-Hispanic whites (2013 - 2014)	*	< LOD	.200 (.100-.200)	.300 (.200-.400)	.400 (.300-.600)	862
Non-Hispanic whites (2015 - 2016)	*	< LOD	.100 (.100-.200)	.200 (.100-.300)	.300 (.200-.500)	619
All Hispanics (2011 - 2012)	*	.110 (<LOD-.130)	.180 (.160-.210)	.310 (.230-.390)	.420 (.300-.630)	406
All Hispanics (2013 - 2014)	*	< LOD	.100 (<LOD-.100)	.200 (.100-.200)	.200 (.100-.600)	537
All Hispanics (2015 - 2016)	*	< LOD	< LOD	.200 (.100-.200)	.300 (.200-.300)	629
Asians (2011 - 2012)	.338 (.277-.412)	.330 (.220-.510)	.840 (.630-1.01)	1.38 (1.02-2.33)	2.40 (1.33-3.41)	291
Asians (2013 - 2014)	.274 (.231-.326)	.300 (.200-.400)	.600 (.400-.800)	1.00 (.900-1.20)	1.50 (1.00-2.40)	236
Asians (2015 - 2016)	.233 (.189-.287)	.300 (.200-.300)	.500 (.400-.600)	1.00 (.600-1.40)	1.50 (.800-2.20)	220

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Serum Perfluoroundecanoic acid (PFUnDA) (2013 – 2014)

CAS Number 2058-94-8

Geometric mean and selected percentiles of serum concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Special Sample of Serum PFAS in Children 3 to 11 Years Old, 2013 – 2014

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	.100 (<LOD-.130)	.200 (.150-.270)	.280 (.210-.480)	639
Age 3-5 years (2013 - 2014)	*	< LOD	.110 (<LOD-.140)	.250 (.110-.480)	.370 (.140-.650)	181
Age 6-11 years (2013 - 2014)	*	< LOD	.100 (<LOD-.130)	.190 (.160-.240)	.250 (.200-.310)	458
Males (2013 - 2014)	*	< LOD	.100 (<LOD-.140)	.190 (.150-.270)	.300 (.180-.530)	343
Females (2013 - 2014)	*	< LOD	.110 (<LOD-.130)	.200 (.140-.280)	.280 (.200-.440)	296
All Hispanics (2013 - 2014)	*	< LOD	.100 (<LOD-.140)	.190 (.150-.220)	.250 (.190-.370)	220
Other (2013 - 2014)	*	< LOD	.110 (<LOD-.140)	.200 (.140-.300)	.300 (.200-.480)	419

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.1.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/PFAS_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

Urinary Mono-benzyl phthalate (MBzP) (1999 – 2010)

CAS Number 2528-16-7

Metabolite of Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	11.0 (9.88-12.3)	12.2 (11.0-13.6)	25.5 (23.5-28.6)	48.3 (39.8-59.3)	74.4 (68.1-83.4)	2541
Total population (2001 - 2002)	10.8 (10.0-11.7)	11.4 (10.7-12.5)	27.4 (24.8-29.7)	58.2 (51.3-63.5)	87.6 (73.7-102)	2782
Total population (2003 - 2004)	9.89 (9.12-10.7)	10.3 (9.22-11.8)	23.3 (21.7-25.2)	47.9 (41.3-54.4)	72.6 (61.4-90.2)	2605
Total population (2005 - 2006)	8.32 (7.28-9.51)	8.93 (7.78-10.4)	20.7 (18.2-23.7)	44.6 (37.6-52.8)	67.1 (57.4-77.7)	2548
Total population (2007 - 2008)	7.24 (6.47-8.09)	8.42 (7.20-9.50)	18.3 (16.6-20.4)	37.3 (31.3-43.3)	58.8 (48.7-69.1)	2604
Total population (2009 - 2010)	6.46 (5.76-7.24)	6.70 (5.97-7.49)	15.4 (13.4-17.1)	31.0 (26.8-36.1)	48.3 (43.1-55.4)	2749
Age 6-11 years (1999 - 2000)	28.4 (23.7-34.0)	29.0 (24.3-35.0)	59.0 (40.2-70.6)	92.8 (70.6-154)	154 (77.8-287)	328
Age 6-11 years (2001 - 2002)	24.1 (21.0-27.6)	26.6 (19.2-31.2)	49.3 (44.4-66.8)	120 (83.7-137)	169 (132-237)	393
Age 6-11 years (2003 - 2004)	24.4 (20.3-29.2)	25.2 (21.7-28.7)	45.9 (36.3-66.5)	105 (79.1-154)	184 (105-263)	342
Age 6-11 years (2005 - 2006)	21.3 (19.2-23.7)	23.5 (19.4-26.6)	46.1 (37.1-56.9)	78.6 (64.3-104)	116 (88.4-137)	356
Age 6-11 years (2007 - 2008)	15.4 (12.3-19.3)	17.6 (13.8-20.8)	33.8 (27.0-47.5)	69.9 (51.3-104)	131 (69.9-221)	389
Age 6-11 years (2009 - 2010)	11.6 (9.51-14.1)	12.6 (10.4-14.5)	28.4 (20.2-37.8)	63.9 (47.4-76.8)	87.8 (65.4-212)	415
Age 12-19 years (1999 - 2000)	18.4 (15.7-21.6)	20.4 (16.1-25.1)	36.9 (31.5-42.1)	63.7 (48.4-82.6)	90.2 (67.5-122)	752
Age 12-19 years (2001 - 2002)	16.7 (14.3-19.6)	17.9 (15.3-22.3)	40.0 (34.1-45.3)	81.1 (66.1-95.5)	122 (96.3-143)	742
Age 12-19 years (2003 - 2004)	15.9 (14.0-18.1)	17.9 (16.1-19.6)	35.9 (28.7-46.5)	64.7 (51.2-86.3)	110 (71.9-136)	729
Age 12-19 years (2005 - 2006)	14.2 (11.9-16.9)	14.8 (11.5-18.3)	31.8 (24.2-41.0)	62.6 (44.0-85.0)	94.2 (67.7-134)	702
Age 12-19 years (2007 - 2008)	11.6 (9.56-14.2)	14.6 (11.5-16.6)	27.2 (22.0-31.5)	46.7 (35.4-58.3)	63.9 (54.7-102)	401
Age 12-19 years (2009 - 2010)	10.6 (8.75-12.9)	11.9 (10.1-15.4)	24.8 (21.9-29.2)	43.1 (36.0-45.8)	56.1 (44.7-74.3)	420
Age 20+ years (1999 - 2000)	8.96 (7.83-10.3)	9.94 (8.71-11.2)	21.0 (18.1-23.8)	37.4 (31.6-45.0)	62.1 (39.4-85.5)	1461
Age 20+ years (2001 - 2002)	9.16 (8.40-9.98)	10.0 (9.22-10.7)	22.9 (20.5-24.1)	47.1 (38.7-54.9)	71.8 (59.6-87.1)	1647
Age 20+ years (2003 - 2004)	8.22 (7.42-9.11)	8.71 (7.78-9.72)	19.4 (17.0-21.2)	39.0 (33.9-44.3)	57.2 (47.9-68.3)	1534
Age 20+ years (2005 - 2006)	6.87 (6.00-7.86)	7.34 (6.41-8.71)	17.1 (14.5-19.7)	34.0 (28.3-43.4)	56.9 (45.9-66.7)	1490
Age 20+ years (2007 - 2008)	6.18 (5.40-7.08)	7.13 (6.12-8.06)	15.5 (13.4-17.6)	30.5 (25.2-37.7)	49.5 (40.3-63.9)	1814
Age 20+ years (2009 - 2010)	5.61 (4.97-6.34)	5.95 (5.17-6.61)	12.7 (10.9-14.8)	25.6 (21.5-29.4)	39.6 (34.2-47.7)	1914
Males (1999 - 2000)	11.6 (10.1-13.4)	12.7 (10.9-14.4)	25.5 (22.7-29.0)	50.0 (43.1-62.8)	77.8 (69.3-93.4)	1215
Males (2001 - 2002)	11.2 (9.78-12.9)	11.5 (10.5-13.3)	26.6 (23.8-31.0)	56.4 (45.7-70.1)	87.5 (63.5-132)	1371
Males (2003 - 2004)	10.5 (9.50-11.6)	10.9 (9.50-12.6)	23.3 (21.2-25.6)	47.2 (38.6-57.3)	72.6 (56.6-94.8)	1250
Males (2005 - 2006)	9.47 (8.20-10.9)	10.2 (8.78-12.2)	23.3 (19.3-25.9)	51.6 (39.8-61.6)	71.0 (61.6-83.2)	1270
Males (2007 - 2008)	7.80 (6.96-8.74)	8.64 (7.49-10.0)	17.6 (15.8-20.4)	33.8 (28.4-41.3)	49.3 (41.5-62.1)	1294
Males (2009 - 2010)	6.93 (6.07-7.92)	6.98 (6.21-7.80)	15.6 (13.3-17.6)	33.0 (27.4-37.8)	49.0 (40.4-62.8)	1399
Females (1999 - 2000)	10.5 (9.17-12.0)	11.6 (10.2-13.8)	25.8 (22.2-29.8)	45.9 (38.7-59.3)	73.9 (60.6-83.4)	1326
Females (2001 - 2002)	10.5 (9.40-11.7)	11.1 (9.94-12.9)	27.4 (23.3-31.5)	58.6 (49.2-66.0)	88.0 (73.2-103)	1411
Females (2003 - 2004)	9.33 (8.53-10.2)	9.58 (8.71-11.2)	24.0 (21.2-26.1)	48.3 (42.3-52.1)	72.5 (60.8-86.3)	1355
Females (2005 - 2006)	7.34 (6.30-8.55)	7.70 (6.55-9.36)	18.4 (15.6-22.2)	39.5 (33.0-46.3)	62.1 (48.0-73.7)	1278
Females (2007 - 2008)	6.73 (5.77-7.85)	7.99 (6.41-9.36)	18.8 (15.4-22.5)	40.1 (32.2-50.9)	64.4 (51.1-78.8)	1310
Females (2009 - 2010)	6.04 (5.38-6.77)	6.36 (5.18-7.47)	15.3 (12.9-16.9)	29.3 (24.5-36.9)	47.7 (38.0-60.4)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.576, 0.216, 0.072, 0.216, 0.216, and 0.216 respectively.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.72 for survey periods 1999-2008 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BzBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-benzyl phthalate (MBzP) (1999 – 2010)

CAS Number 2528-16-7

Metabolite of Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	10.0 (8.69-11.6)	11.3 (9.65-12.2)	23.8 (19.8-26.0)	48.6 (40.0-60.5)	71.1 (58.0-108)	814
Mexican Americans (2001 - 2002)	9.49 (7.75-11.6)	10.7 (7.78-13.3)	21.2 (18.9-27.4)	50.7 (38.2-61.5)	68.2 (50.6-116)	677
Mexican Americans (2003 - 2004)	10.7 (9.52-12.0)	11.2 (9.72-13.2)	23.3 (19.9-25.5)	51.4 (35.0-66.5)	71.9 (62.3-104)	652
Mexican Americans (2005 - 2006)	8.95 (7.12-11.3)	10.2 (8.57-11.9)	20.1 (14.3-31.0)	43.1 (33.9-49.8)	59.8 (43.6-77.3)	637
Mexican Americans (2007 - 2008)	7.87 (6.39-9.68)	9.43 (6.91-11.5)	18.7 (14.1-25.3)	38.0 (30.2-47.5)	60.4 (40.5-73.9)	531
Mexican Americans (2009 - 2010)	7.58 (6.42-8.96)	7.39 (6.33-9.00)	17.1 (14.3-20.3)	33.8 (26.5-43.5)	54.5 (34.4-79.7)	566
Non-Hispanic blacks (1999 - 2000)	16.6 (14.9-18.4)	16.6 (14.8-18.4)	35.5 (31.7-40.0)	68.2 (57.6-93.4)	99.1 (76.6-174)	603
Non-Hispanic blacks (2001 - 2002)	17.1 (15.1-19.4)	17.4 (14.3-20.2)	36.4 (29.9-45.3)	72.6 (62.2-91.3)	103 (91.2-129)	703
Non-Hispanic blacks (2003 - 2004)	13.6 (11.8-15.7)	14.4 (11.1-17.7)	31.5 (28.0-35.3)	58.2 (50.4-76.0)	86.2 (71.8-124)	699
Non-Hispanic blacks (2005 - 2006)	11.9 (9.03-15.7)	12.7 (10.1-17.1)	26.1 (21.0-35.0)	60.6 (47.2-74.6)	83.2 (74.6-102)	678
Non-Hispanic blacks (2007 - 2008)	9.37 (8.28-10.6)	9.72 (8.35-11.7)	21.4 (18.4-24.8)	46.9 (34.3-61.6)	71.3 (63.7-89.6)	597
Non-Hispanic blacks (2009 - 2010)	8.98 (7.67-10.5)	9.14 (7.76-10.5)	21.0 (16.4-24.7)	38.9 (30.3-52.6)	67.4 (51.3-80.7)	516
Non-Hispanic whites (1999 - 2000)	10.3 (9.12-11.6)	11.6 (10.3-13.4)	24.5 (22.0-27.6)	42.3 (36.9-53.4)	73.9 (53.4-83.4)	912
Non-Hispanic whites (2001 - 2002)	10.1 (9.12-11.1)	10.5 (9.65-11.2)	25.6 (23.2-28.4)	55.2 (47.6-65.0)	87.5 (67.1-112)	1216
Non-Hispanic whites (2003 - 2004)	9.25 (8.30-10.3)	9.50 (8.42-11.5)	22.0 (20.0-25.3)	45.9 (38.6-52.1)	65.9 (54.9-87.9)	1088
Non-Hispanic whites (2005 - 2006)	7.67 (6.61-8.90)	8.06 (6.98-10.1)	19.8 (17.1-23.5)	43.4 (32.4-52.5)	65.8 (52.5-76.8)	1038
Non-Hispanic whites (2007 - 2008)	7.10 (6.33-7.97)	8.14 (7.06-9.29)	17.9 (16.5-20.3)	37.7 (31.0-44.2)	57.0 (46.0-68.6)	1077
Non-Hispanic whites (2009 - 2010)	6.07 (5.24-7.03)	6.31 (5.54-7.23)	14.7 (12.4-16.7)	29.5 (23.4-36.9)	44.6 (34.9-64.1)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.576, 0.216, 0.072, 0.216, 0.216, and 0.216 respectively.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.72 for survey periods 1999-2008 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BzBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-benzyl phthalate (MBzP) (2011 – 2016)

CAS Number 2528-16-7

Metabolite of Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	4.52 (4.17-4.90)	4.40 (4.10-5.00)	10.7 (9.80-12.2)	21.7 (20.2-24.4)	35.9 (29.2-41.7)	2489
Total population (2013 - 2014)	4.45 (4.07-4.86)	4.50 (4.10-5.00)	11.0 (9.50-12.7)	23.1 (20.5-25.6)	35.1 (28.4-40.2)	2685
Total population (2015 - 2016)	4.47 (3.91-5.10)	4.30 (3.80-4.90)	10.7 (9.70-11.5)	26.0 (22.5-29.4)	44.8 (37.8-56.3)	2975
Age 3-5 years (2015 - 2016)	8.27 (6.78-10.1)	7.10 (5.50-9.00)	20.5 (16.2-26.0)	55.8 (44.4-76.5)	88.1 (75.1-134)	465
Age 6-11 years (2011 - 2012)	8.62 (7.22-10.3)	8.50 (6.60-10.4)	21.6 (15.8-26.2)	50.7 (31.4-71.7)	75.2 (51.3-124)	396
Age 6-11 years (2013 - 2014)	8.55 (7.14-10.2)	8.40 (6.50-10.3)	20.2 (15.0-25.2)	36.6 (28.9-56.3)	59.9 (42.6-86.9)	409
Age 6-11 years (2015 - 2016)	10.7 (8.58-13.3)	10.9 (8.40-13.8)	26.7 (20.6-33.3)	59.2 (41.6-73.2)	81.1 (61.8-174)	415
Age 12-19 years (2011 - 2012)	6.62 (5.28-8.30)	7.30 (4.80-10.2)	17.0 (13.3-20.2)	31.5 (24.1-39.2)	42.6 (33.4-65.3)	388
Age 12-19 years (2013 - 2014)	6.55 (5.62-7.62)	7.50 (5.60-9.60)	14.7 (11.3-18.7)	25.0 (21.2-35.1)	38.8 (31.3-50.2)	462
Age 12-19 years (2015 - 2016)	6.05 (4.33-8.45)	6.50 (4.70-8.40)	14.1 (10.5-17.5)	26.6 (20.8-34.5)	43.5 (25.8-80.6)	405
Age 20+ years (2011 - 2012)	3.98 (3.60-4.39)	4.00 (3.70-4.40)	9.70 (8.10-10.5)	19.2 (17.0-21.0)	28.0 (22.4-37.0)	1705
Age 20+ years (2013 - 2014)	3.91 (3.53-4.34)	4.00 (3.60-4.40)	9.10 (7.80-11.0)	21.2 (19.9-23.2)	30.9 (25.8-37.1)	1814
Age 20+ years (2015 - 2016)	3.80 (3.39-4.27)	3.70 (3.20-4.30)	8.50 (8.00-9.30)	21.3 (18.1-24.5)	37.8 (29.9-46.8)	1690
Males (2011 - 2012)	4.80 (4.25-5.41)	4.80 (4.20-5.40)	11.1 (9.80-12.7)	22.4 (19.9-25.7)	37.0 (28.0-58.3)	1259
Males (2013 - 2014)	4.67 (4.20-5.19)	4.80 (4.30-5.40)	10.5 (9.10-12.0)	21.8 (19.9-23.8)	36.0 (28.6-42.7)	1285
Males (2015 - 2016)	4.60 (3.99-5.29)	4.50 (4.00-5.10)	10.9 (9.50-12.1)	28.1 (21.8-32.5)	43.5 (32.9-58.5)	1474
Females (2011 - 2012)	4.27 (3.81-4.77)	4.20 (3.80-4.90)	10.5 (9.50-12.3)	21.6 (19.7-24.4)	33.9 (27.4-42.0)	1230
Females (2013 - 2014)	4.25 (3.80-4.75)	4.30 (3.80-4.90)	11.8 (8.80-13.8)	24.7 (20.2-27.4)	35.1 (26.9-43.4)	1400
Females (2015 - 2016)	4.35 (3.76-5.03)	4.20 (3.40-5.00)	10.2 (9.30-11.5)	23.9 (21.4-29.3)	47.6 (34.8-59.2)	1501
Mexican Americans (2011 - 2012)	5.11 (4.03-6.48)	5.10 (3.90-6.60)	11.3 (7.60-16.9)	20.4 (14.7-28.8)	29.1 (19.9-69.3)	316
Mexican Americans (2013 - 2014)	4.33 (3.82-4.90)	4.20 (3.70-5.20)	9.30 (8.00-11.3)	18.6 (15.5-22.3)	28.4 (20.1-45.3)	438
Mexican Americans (2015 - 2016)	4.42 (3.34-5.86)	4.10 (3.10-5.60)	11.4 (6.90-15.7)	26.5 (17.1-40.0)	42.5 (26.2-83.6)	595
Non-Hispanic blacks (2011 - 2012)	7.43 (6.14-8.98)	7.50 (6.40-9.00)	16.4 (13.4-20.1)	33.9 (24.3-48.6)	54.9 (42.7-76.1)	665
Non-Hispanic blacks (2013 - 2014)	6.55 (5.72-7.49)	6.50 (5.60-8.10)	17.3 (14.9-19.5)	33.5 (28.4-37.6)	55.0 (37.6-75.3)	609
Non-Hispanic blacks (2015 - 2016)	7.00 (5.60-8.74)	6.50 (5.30-8.30)	16.6 (13.2-19.3)	39.3 (30.1-49.1)	57.8 (49.8-72.6)	698
Non-Hispanic whites (2011 - 2012)	4.14 (3.84-4.46)	4.10 (3.80-4.40)	10.1 (8.50-11.4)	20.2 (17.9-22.9)	30.4 (24.8-38.2)	813
Non-Hispanic whites (2013 - 2014)	4.34 (3.87-4.86)	4.40 (3.90-5.10)	10.9 (8.70-13.3)	22.9 (20.1-25.9)	35.1 (26.9-42.7)	987
Non-Hispanic whites (2015 - 2016)	4.23 (3.58-4.99)	4.20 (3.50-5.00)	9.90 (8.40-11.2)	24.5 (21.1-30.1)	42.7 (32.6-52.6)	862
All Hispanics (2011 - 2012)	4.80 (4.03-5.72)	4.90 (4.00-5.70)	11.3 (8.40-14.8)	22.4 (17.6-29.8)	33.6 (22.4-45.5)	571
All Hispanics (2013 - 2014)	4.24 (3.88-4.63)	4.40 (3.80-4.80)	9.10 (8.10-10.7)	19.1 (16.3-20.8)	28.6 (21.2-39.5)	690
All Hispanics (2015 - 2016)	4.50 (3.69-5.50)	4.20 (3.40-5.10)	11.8 (8.80-14.7)	27.6 (19.9-36.2)	44.2 (29.9-77.3)	971
Asians (2011 - 2012)	2.99 (2.44-3.67)	2.90 (2.40-3.50)	7.20 (5.20-9.50)	15.1 (11.2-21.5)	27.7 (17.5-45.9)	352
Asians (2013 - 2014)	2.50 (2.02-3.08)	2.60 (1.90-3.80)	5.60 (4.20-7.60)	14.4 (9.40-17.5)	21.9 (17.0-24.1)	289
Asians (2015 - 2016)	2.69 (1.83-3.96)	2.80 (1.60-4.70)	6.00 (3.80-11.7)	14.2 (8.00-23.4)	23.4 (14.8-29.8)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.3, 0.3, and 0.3, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BzBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-benzyl phthalate (MBzP) (creatinine corrected) (1999 – 2010)

CAS Number 2528-16-7

Metabolite of Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	10.0 (9.33-10.8)	9.60 (9.22-10.3)	18.1 (16.8-19.6)	36.1 (29.9-42.3)	55.7 (50.1-62.1)	2541
Total population (2001 - 2002)	10.2 (9.50-10.9)	9.71 (9.12-10.4)	19.1 (17.8-20.9)	39.5 (35.3-42.1)	65.1 (53.6-73.2)	2782
Total population (2003 - 2004)	9.29 (8.76-9.86)	9.04 (8.07-9.82)	17.7 (16.0-19.0)	33.1 (29.5-37.1)	50.4 (44.9-57.5)	2605
Total population (2005 - 2006)	8.11 (7.28-9.04)	8.24 (7.37-8.98)	15.3 (13.9-17.4)	30.2 (26.4-35.1)	47.4 (42.7-53.3)	2548
Total population (2007 - 2008)	7.29 (6.71-7.93)	7.20 (6.57-8.17)	14.3 (13.1-15.4)	28.3 (24.4-31.8)	42.6 (36.3-49.1)	2604
Total population (2009 - 2010)	6.74 (6.06-7.50)	6.40 (5.63-7.30)	12.4 (11.3-13.8)	24.0 (20.4-26.6)	34.1 (30.5-41.4)	2749
Age 6-11 years (1999 - 2000)	28.8 (24.2-34.3)	27.8 (21.7-36.9)	52.9 (40.8-71.4)	75.1 (64.4-102)	102 (71.8-124)	328
Age 6-11 years (2001 - 2002)	27.4 (24.8-30.3)	26.9 (24.3-30.4)	48.9 (40.2-57.9)	96.7 (83.3-127)	140 (86.9-219)	393
Age 6-11 years (2003 - 2004)	25.8 (21.9-30.3)	23.2 (20.1-29.1)	43.7 (36.1-57.2)	97.8 (61.6-154)	165 (71.8-286)	342
Age 6-11 years (2005 - 2006)	23.5 (21.1-26.2)	25.5 (20.5-29.5)	47.1 (35.8-57.8)	77.6 (62.8-94.3)	104 (85.8-130)	356
Age 6-11 years (2007 - 2008)	19.0 (16.0-22.5)	20.7 (15.6-27.0)	35.4 (32.3-40.0)	67.2 (51.9-91.5)	118 (74.3-159)	389
Age 6-11 years (2009 - 2010)	15.1 (12.7-18.0)	14.6 (12.0-17.2)	29.3 (25.9-37.6)	66.5 (45.3-84.1)	92.2 (67.1-163)	415
Age 12-19 years (1999 - 2000)	12.4 (11.1-14.0)	12.3 (10.5-14.6)	20.4 (17.5-25.1)	35.8 (27.9-49.9)	50.4 (35.7-59.0)	752
Age 12-19 years (2001 - 2002)	12.9 (11.3-14.8)	13.0 (11.3-15.0)	24.4 (21.1-27.8)	48.7 (40.2-61.9)	72.0 (58.1-88.6)	742
Age 12-19 years (2003 - 2004)	11.9 (11.1-12.8)	12.2 (11.1-13.1)	21.6 (18.0-25.6)	37.5 (29.3-44.5)	56.0 (39.5-82.6)	729
Age 12-19 years (2005 - 2006)	10.6 (9.14-12.2)	10.5 (8.33-13.0)	18.5 (15.9-23.7)	35.8 (28.1-46.0)	48.8 (41.3-65.3)	702
Age 12-19 years (2007 - 2008)	9.06 (7.76-10.6)	9.39 (8.12-11.1)	16.7 (13.8-21.0)	32.1 (22.0-45.9)	48.4 (32.3-55.6)	401
Age 12-19 years (2009 - 2010)	8.54 (7.36-9.90)	8.73 (7.44-10.8)	14.9 (13.2-17.5)	24.9 (21.6-28.9)	32.5 (25.7-42.7)	420
Age 20+ years (1999 - 2000)	8.47 (7.73-9.27)	8.68 (8.01-9.26)	14.5 (13.2-16.8)	24.9 (22.0-29.4)	41.1 (29.7-53.2)	1461
Age 20+ years (2001 - 2002)	8.66 (8.08-9.28)	8.47 (8.00-9.00)	15.6 (14.3-17.1)	30.5 (25.8-34.7)	46.8 (39.0-56.4)	1647
Age 20+ years (2003 - 2004)	7.90 (7.39-8.45)	7.58 (6.98-8.37)	14.2 (13.1-15.4)	26.3 (25.0-28.2)	40.2 (33.7-44.9)	1534
Age 20+ years (2005 - 2006)	6.89 (6.20-7.66)	7.10 (6.60-7.71)	13.1 (12.1-14.2)	22.4 (19.9-25.5)	34.6 (28.9-43.1)	1490
Age 20+ years (2007 - 2008)	6.35 (5.74-7.03)	6.41 (5.65-7.15)	12.3 (11.1-13.6)	21.8 (19.1-25.7)	32.6 (28.7-40.5)	1814
Age 20+ years (2009 - 2010)	5.94 (5.31-6.66)	5.67 (5.03-6.53)	10.8 (9.18-12.5)	19.2 (16.6-23.5)	29.1 (24.2-33.4)	1914
Males (1999 - 2000)	9.14 (8.51-9.82)	8.96 (8.32-9.39)	17.1 (15.5-18.8)	32.0 (25.5-41.0)	52.9 (34.9-71.8)	1215
Males (2001 - 2002)	9.13 (8.18-10.2)	8.55 (7.85-9.53)	17.4 (15.1-19.0)	35.3 (31.5-40.4)	57.8 (43.8-74.7)	1371
Males (2003 - 2004)	8.25 (7.60-8.95)	7.99 (7.01-9.03)	15.2 (14.0-17.0)	28.4 (24.6-35.8)	45.3 (37.4-59.8)	1250
Males (2005 - 2006)	7.61 (6.65-8.70)	7.57 (6.65-8.91)	14.3 (13.0-16.6)	30.0 (25.5-34.5)	43.7 (36.2-48.2)	1270
Males (2007 - 2008)	6.57 (5.91-7.31)	6.66 (5.68-7.46)	12.8 (11.3-14.8)	24.4 (21.2-29.5)	36.3 (30.6-45.5)	1294
Males (2009 - 2010)	6.21 (5.56-6.94)	5.88 (5.13-6.74)	11.6 (10.1-12.9)	21.3 (18.8-24.1)	32.2 (27.6-35.6)	1399
Females (1999 - 2000)	11.0 (9.96-12.1)	10.6 (9.60-11.5)	18.6 (17.3-21.1)	40.6 (33.7-43.6)	57.9 (43.3-84.2)	1326
Females (2001 - 2002)	11.3 (10.2-12.4)	10.8 (9.97-11.9)	21.2 (18.6-24.5)	42.1 (35.9-50.0)	69.0 (50.0-83.4)	1411
Females (2003 - 2004)	10.4 (9.65-11.2)	9.97 (9.20-10.9)	20.1 (17.8-22.6)	37.4 (31.2-43.4)	52.9 (45.8-65.0)	1355
Females (2005 - 2006)	8.63 (7.84-9.51)	8.67 (8.12-9.26)	15.9 (14.8-18.3)	32.0 (26.3-41.4)	52.3 (45.2-62.8)	1278
Females (2007 - 2008)	8.07 (7.29-8.93)	8.37 (7.20-9.16)	15.5 (13.9-18.0)	31.5 (27.5-34.2)	48.3 (40.2-54.9)	1310
Females (2009 - 2010)	7.29 (6.47-8.21)	6.90 (5.90-8.04)	13.6 (11.9-15.3)	25.6 (21.9-30.4)	38.8 (30.7-47.3)	1350

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.72 for survey periods 1999-2008 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BzBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-benzyl phthalate (MBzP) (creatinine corrected) (1999 – 2010)

CAS Number 2528-16-7

Metabolite of Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	9.10 (8.20-10.1)	8.60 (7.87-9.53)	17.4 (15.5-19.1)	33.5 (30.2-38.7)	49.1 (40.6-67.5)	814
Mexican Americans (2001 - 2002)	8.95 (7.69-10.4)	8.55 (7.16-10.7)	17.1 (14.1-20.9)	33.6 (26.3-44.4)	51.5 (36.8-86.5)	677
Mexican Americans (2003 - 2004)	9.66 (8.41-11.1)	9.00 (8.25-9.66)	17.3 (15.1-20.0)	38.2 (27.6-46.7)	56.0 (41.1-89.8)	652
Mexican Americans (2005 - 2006)	8.05 (6.69-9.69)	8.38 (7.48-8.91)	16.0 (12.6-20.2)	31.0 (22.4-40.6)	45.7 (31.3-54.2)	637
Mexican Americans (2007 - 2008)	7.68 (6.13-9.62)	8.06 (6.42-10.3)	15.5 (12.5-19.2)	29.1 (21.9-36.9)	42.9 (33.5-51.8)	531
Mexican Americans (2009 - 2010)	7.53 (6.52-8.69)	7.29 (6.30-8.18)	13.3 (11.6-16.3)	32.3 (23.3-43.6)	52.2 (33.0-66.1)	566
Non-Hispanic blacks (1999 - 2000)	10.7 (9.75-11.7)	9.83 (8.76-10.9)	19.4 (16.2-22.9)	40.5 (28.4-54.7)	62.5 (46.4-71.9)	603
Non-Hispanic blacks (2001 - 2002)	12.0 (10.5-13.7)	11.3 (9.84-13.9)	24.1 (19.1-27.4)	43.3 (38.7-50.0)	77.7 (54.4-83.4)	703
Non-Hispanic blacks (2003 - 2004)	9.65 (8.46-11.0)	9.81 (8.32-11.2)	17.4 (15.8-20.7)	36.0 (29.6-41.6)	53.8 (42.5-65.2)	699
Non-Hispanic blacks (2005 - 2006)	8.38 (6.44-10.9)	8.24 (6.72-10.6)	16.1 (12.8-21.5)	34.1 (25.8-43.9)	52.3 (39.9-62.9)	678
Non-Hispanic blacks (2007 - 2008)	7.28 (6.51-8.14)	7.07 (5.97-8.28)	14.7 (12.2-16.0)	25.8 (22.6-31.5)	42.3 (32.6-50.3)	597
Non-Hispanic blacks (2009 - 2010)	6.50 (5.49-7.70)	6.50 (5.38-7.45)	11.7 (9.80-14.9)	23.9 (17.0-31.8)	34.4 (25.8-48.9)	516
Non-Hispanic whites (1999 - 2000)	10.0 (9.16-11.0)	9.66 (9.25-10.7)	18.2 (16.6-19.8)	38.3 (27.9-46.7)	56.1 (48.5-65.0)	912
Non-Hispanic whites (2001 - 2002)	9.97 (9.24-10.8)	9.33 (8.69-10.3)	18.5 (17.1-20.1)	38.2 (33.5-42.1)	64.2 (49.7-78.5)	1216
Non-Hispanic whites (2003 - 2004)	9.14 (8.48-9.84)	8.97 (7.77-9.93)	17.6 (15.6-19.2)	30.2 (28.1-35.2)	47.2 (41.4-57.3)	1088
Non-Hispanic whites (2005 - 2006)	8.08 (7.17-9.10)	8.35 (7.31-9.49)	15.2 (13.7-17.4)	29.9 (25.1-36.5)	47.4 (40.0-57.1)	1038
Non-Hispanic whites (2007 - 2008)	7.42 (6.90-7.97)	7.38 (6.65-8.23)	14.0 (12.9-15.4)	28.3 (24.2-32.3)	44.5 (36.3-52.4)	1077
Non-Hispanic whites (2009 - 2010)	6.83 (6.08-7.67)	6.37 (5.58-7.34)	12.6 (11.1-14.5)	24.0 (19.5-27.6)	33.4 (27.9-44.6)	1206

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.72 for survey periods 1999-2008 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BzBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-benzyl phthalate (MBzP) (creatinine corrected) (2011 – 2016)

CAS Number 2528-16-7

Metabolite of Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	5.15 (4.80-5.52)	4.96 (4.62-5.35)	9.49 (8.71-10.5)	17.4 (16.2-19.1)	26.7 (24.3-30.0)	2487
Total population (2013 - 2014)	4.46 (4.13-4.81)	4.20 (3.78-4.62)	8.40 (7.56-9.32)	17.9 (15.6-19.5)	25.8 (21.3-32.1)	2684
Total population (2015 - 2016)	4.63 (4.06-5.28)	4.17 (3.60-4.89)	9.83 (8.25-11.3)	21.0 (18.2-26.0)	36.8 (31.4-42.5)	2974
Age 3-5 years (2015 - 2016)	19.7 (16.3-24.0)	17.6 (13.9-21.7)	46.4 (32.9-64.2)	115 (82.6-142)	183 (131-211)	464
Age 6-11 years (2011 - 2012)	12.5 (10.8-14.5)	11.9 (10.0-14.3)	24.1 (18.5-28.9)	53.2 (35.9-67.4)	81.0 (54.1-97.7)	395
Age 6-11 years (2013 - 2014)	10.8 (9.23-12.6)	10.3 (8.79-12.6)	19.9 (16.5-24.0)	39.6 (25.6-74.1)	78.1 (38.3-168)	409
Age 6-11 years (2015 - 2016)	13.8 (11.3-16.8)	12.0 (10.0-15.6)	28.4 (20.7-42.2)	57.9 (49.0-85.7)	113 (57.9-156)	415
Age 12-19 years (2011 - 2012)	6.45 (5.81-7.16)	6.23 (5.39-7.54)	11.7 (10.1-13.2)	18.3 (15.2-22.1)	25.5 (20.3-39.9)	388
Age 12-19 years (2013 - 2014)	5.31 (4.68-6.03)	5.04 (4.42-5.65)	9.90 (8.22-12.1)	17.9 (13.9-23.3)	30.6 (18.2-35.1)	462
Age 12-19 years (2015 - 2016)	4.70 (3.68-6.00)	4.34 (3.80-5.50)	8.43 (6.32-11.2)	17.8 (11.6-24.8)	28.2 (17.8-36.8)	405
Age 20+ years (2011 - 2012)	4.52 (4.18-4.89)	4.46 (4.05-4.76)	8.08 (7.50-8.83)	15.1 (12.9-16.8)	21.6 (18.5-24.5)	1704
Age 20+ years (2013 - 2014)	3.95 (3.59-4.34)	3.78 (3.36-4.18)	7.14 (6.39-8.04)	15.2 (13.2-17.7)	22.3 (18.7-26.5)	1813
Age 20+ years (2015 - 2016)	3.87 (3.43-4.38)	3.44 (3.05-4.10)	8.11 (6.40-9.37)	15.4 (13.6-18.3)	27.6 (21.0-31.8)	1690
Males (2011 - 2012)	4.49 (4.01-5.04)	4.26 (3.91-4.73)	8.46 (7.56-9.10)	15.4 (13.8-18.3)	24.7 (18.3-37.0)	1258
Males (2013 - 2014)	3.92 (3.62-4.25)	3.71 (3.33-4.08)	7.16 (6.42-7.87)	15.6 (13.7-17.7)	23.2 (19.4-27.7)	1284
Males (2015 - 2016)	4.10 (3.53-4.76)	3.72 (3.08-4.30)	9.18 (7.22-11.3)	18.9 (15.2-24.8)	35.4 (27.6-44.8)	1474
Females (2011 - 2012)	5.87 (5.43-6.35)	5.65 (5.00-6.43)	10.5 (9.45-12.1)	19.7 (16.4-23.3)	28.7 (24.5-34.8)	1229
Females (2013 - 2014)	5.04 (4.60-5.52)	4.62 (4.25-5.17)	9.73 (8.18-11.5)	19.5 (16.2-24.2)	28.8 (23.6-37.7)	1400
Females (2015 - 2016)	5.20 (4.57-5.92)	4.60 (4.02-5.22)	10.3 (8.57-11.9)	23.1 (19.8-28.0)	37.2 (31.3-45.0)	1500
Mexican Americans (2011 - 2012)	5.76 (4.41-7.51)	5.86 (5.00-7.08)	10.2 (8.61-13.1)	17.8 (12.4-34.6)	28.3 (17.1-50.2)	316
Mexican Americans (2013 - 2014)	4.41 (3.77-5.16)	4.00 (3.25-5.12)	7.57 (6.12-10.7)	16.5 (12.9-24.7)	26.4 (18.6-36.9)	438
Mexican Americans (2015 - 2016)	4.81 (3.56-6.50)	4.27 (2.98-6.13)	10.0 (6.98-15.0)	26.3 (14.9-41.3)	41.4 (31.4-59.7)	595
Non-Hispanic blacks (2011 - 2012)	5.78 (4.83-6.92)	5.30 (4.49-6.16)	10.5 (8.68-13.6)	21.1 (17.4-27.5)	35.3 (25.2-53.4)	665
Non-Hispanic blacks (2013 - 2014)	4.83 (4.31-5.42)	4.77 (4.26-5.38)	9.71 (8.12-11.6)	19.9 (15.4-25.6)	29.4 (24.8-33.4)	609
Non-Hispanic blacks (2015 - 2016)	5.57 (4.72-6.58)	5.00 (4.18-5.98)	10.6 (8.52-14.2)	28.7 (19.5-38.8)	50.7 (39.2-67.9)	697
Non-Hispanic whites (2011 - 2012)	5.04 (4.67-5.44)	4.82 (4.44-5.37)	9.11 (8.18-10.7)	16.6 (15.1-18.5)	24.7 (21.4-28.7)	811
Non-Hispanic whites (2013 - 2014)	4.57 (4.11-5.07)	4.24 (3.70-4.76)	8.50 (7.32-10.2)	18.5 (15.6-20.3)	25.8 (21.0-34.4)	987
Non-Hispanic whites (2015 - 2016)	4.54 (3.89-5.30)	4.00 (3.28-4.93)	9.91 (8.14-11.5)	20.3 (16.6-24.5)	35.5 (28.5-42.0)	862
All Hispanics (2011 - 2012)	5.38 (4.45-6.51)	5.29 (4.55-6.14)	9.63 (7.95-12.7)	18.4 (13.9-34.6)	35.6 (18.4-49.3)	571
All Hispanics (2013 - 2014)	4.21 (3.78-4.68)	3.91 (3.36-4.56)	7.57 (6.67-8.64)	15.6 (13.2-18.6)	24.7 (18.4-32.6)	690
All Hispanics (2015 - 2016)	4.75 (3.79-5.94)	4.25 (3.23-5.38)	10.2 (7.54-13.8)	24.8 (15.2-35.4)	41.3 (31.1-55.0)	971
Asians (2011 - 2012)	4.01 (3.49-4.60)	3.96 (3.27-4.72)	7.74 (6.39-9.73)	13.4 (10.5-16.4)	20.5 (14.3-27.7)	352
Asians (2013 - 2014)	3.16 (2.58-3.87)	3.29 (2.37-4.00)	6.33 (5.00-8.00)	14.7 (10.8-16.4)	17.8 (14.7-30.8)	288
Asians (2015 - 2016)	3.33 (2.51-4.44)	3.17 (2.15-4.58)	6.30 (4.97-9.14)	13.3 (7.92-22.1)	20.0 (14.3-25.2)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/BzBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-3-hydroxybutyl phthalate (MHBP) (2013 – 2016)

CAS Number 2528-16-7

Metabolite of Di-n-butyl phthalate (DBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.814 (.762-.870)	.800 (.700-.900)	1.60 (1.40-1.70)	2.90 (2.60-3.10)	4.10 (3.70-4.50)	2681
Total population (2015 - 2016)	.895 (.828-.968)	.900 (.800-.900)	1.70 (1.60-1.90)	3.40 (3.00-3.90)	4.70 (4.10-5.50)	2975
Age 3-5 years (2015 - 2016)	1.26 (1.13-1.39)	1.40 (1.00-1.50)	2.40 (2.10-2.70)	4.10 (3.20-4.90)	5.90 (4.70-7.30)	465
Age 6-11 years (2013 - 2014)	1.16 (.944-1.42)	1.20 (.900-1.50)	2.30 (1.90-2.80)	4.10 (3.10-5.30)	5.30 (4.00-9.40)	409
Age 6-11 years (2015 - 2016)	1.50 (1.39-1.63)	1.70 (1.40-1.80)	2.80 (2.50-3.20)	4.10 (3.50-5.00)	5.60 (4.70-7.20)	415
Age 12-19 years (2013 - 2014)	1.04 (.967-1.12)	1.10 (.900-1.20)	1.90 (1.70-2.20)	3.40 (2.50-3.80)	4.10 (3.70-4.60)	461
Age 12-19 years (2015 - 2016)	1.10 (.904-1.33)	1.10 (.900-1.30)	2.10 (1.50-2.80)	4.10 (3.10-5.20)	5.40 (4.20-6.10)	405
Age 20+ years (2013 - 2014)	.756 (.704-.812)	.700 (.600-.800)	1.40 (1.30-1.60)	2.60 (2.40-3.00)	3.90 (3.30-4.40)	1811
Age 20+ years (2015 - 2016)	.811 (.749-.879)	.800 (.700-.900)	1.50 (1.40-1.70)	3.10 (2.40-3.60)	4.50 (3.60-5.50)	1690
Males (2013 - 2014)	.805 (.728-.891)	.800 (.700-.900)	1.60 (1.30-1.70)	2.60 (2.20-3.30)	4.10 (3.00-5.10)	1284
Males (2015 - 2016)	.847 (.770-.932)	.800 (.700-.900)	1.60 (1.40-1.80)	3.10 (2.60-3.60)	4.30 (3.60-5.50)	1474
Females (2013 - 2014)	.823 (.757-.895)	.800 (.700-.900)	1.70 (1.40-1.90)	3.10 (2.60-3.40)	4.00 (3.50-4.40)	1397
Females (2015 - 2016)	.944 (.862-1.03)	.900 (.800-1.00)	1.80 (1.70-1.90)	3.60 (3.20-4.30)	4.80 (4.30-5.90)	1501
Mexican Americans (2013 - 2014)	.768 (.691-.854)	.700 (.600-.800)	1.40 (1.10-1.70)	2.40 (2.10-3.20)	4.10 (3.10-4.90)	438
Mexican Americans (2015 - 2016)	.901 (.800-1.01)	.800 (.700-1.00)	1.80 (1.50-2.10)	3.20 (2.60-4.00)	4.30 (3.70-5.30)	595
Non-Hispanic blacks (2013 - 2014)	.942 (.848-1.05)	1.00 (.800-1.10)	1.80 (1.60-1.90)	3.00 (2.60-3.80)	4.20 (3.50-5.30)	608
Non-Hispanic blacks (2015 - 2016)	1.06 (.944-1.18)	1.00 (.900-1.20)	2.10 (1.80-2.40)	4.10 (3.50-4.60)	5.80 (4.40-9.40)	698
Non-Hispanic whites (2013 - 2014)	.806 (.729-.892)	.800 (.600-.900)	1.60 (1.30-1.80)	3.00 (2.60-3.20)	4.10 (3.40-4.80)	986
Non-Hispanic whites (2015 - 2016)	.869 (.795-.949)	.900 (.800-.900)	1.70 (1.50-1.80)	3.30 (2.70-4.00)	4.70 (3.90-5.60)	862
All Hispanics (2013 - 2014)	.794 (.734-.859)	.700 (.700-.800)	1.60 (1.30-1.70)	2.80 (2.40-3.20)	4.10 (3.50-5.00)	690
All Hispanics (2015 - 2016)	.917 (.853-.985)	.900 (.800-1.00)	1.80 (1.60-1.90)	3.30 (2.90-3.60)	4.30 (3.90-5.00)	971
Asians (2013 - 2014)	.676 (.585-.781)	.600 (.500-.800)	1.30 (1.10-1.60)	2.20 (1.90-2.90)	3.50 (2.30-4.00)	287
Asians (2015 - 2016)	.830 (.647-1.07)	.800 (.600-.900)	1.50 (1.20-2.10)	3.00 (2.40-3.90)	5.00 (3.40-7.00)	301

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.4 and 0.4, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-3-hydroxybutyl phthalate (MHBP) (creatinine corrected) (2013 – 2016)

CAS Number 2528-16-7

Metabolite of Di-n-butyl phthalate (DBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.817 (.742-.900)	.814 (.725-.903)	1.33 (1.22-1.46)	2.24 (2.05-2.48)	3.30 (2.80-3.93)	2680
Total population (2015 - 2016)	.927 (.877-.979)	.897 (.847-.966)	1.59 (1.47-1.71)	2.68 (2.46-2.97)	3.87 (3.51-4.30)	2974
Age 3-5 years (2015 - 2016)	2.99 (2.71-3.29)	3.04 (2.76-3.33)	4.71 (3.92-5.19)	7.57 (6.15-8.75)	9.75 (8.18-12.1)	464
Age 6-11 years (2013 - 2014)	1.46 (1.23-1.74)	1.41 (1.19-1.71)	2.45 (2.00-3.11)	4.27 (3.11-5.91)	6.40 (4.09-9.38)	409
Age 6-11 years (2015 - 2016)	1.94 (1.77-2.12)	1.86 (1.74-2.00)	2.80 (2.55-3.30)	4.81 (4.11-6.07)	7.42 (5.39-9.09)	415
Age 12-19 years (2013 - 2014)	.844 (.733-.971)	.823 (.718-.959)	1.32 (1.11-1.52)	2.05 (1.59-3.10)	3.21 (1.97-4.80)	461
Age 12-19 years (2015 - 2016)	.853 (.748-.973)	.825 (.704-.924)	1.43 (1.16-1.88)	2.50 (1.86-3.09)	3.09 (2.46-4.00)	405
Age 20+ years (2013 - 2014)	.763 (.688-.845)	.763 (.683-.872)	1.25 (1.14-1.37)	2.15 (1.83-2.33)	2.96 (2.42-3.42)	1810
Age 20+ years (2015 - 2016)	.827 (.778-.879)	.811 (.752-.886)	1.39 (1.27-1.47)	2.16 (1.87-2.50)	3.06 (2.57-3.37)	1690
Males (2013 - 2014)	.677 (.606-.756)	.660 (.596-.723)	1.08 (.952-1.30)	1.88 (1.58-2.24)	3.10 (2.19-4.02)	1283
Males (2015 - 2016)	.756 (.699-.817)	.732 (.647-.797)	1.26 (1.14-1.44)	2.27 (2.05-2.58)	3.37 (2.91-3.85)	1474
Females (2013 - 2014)	.978 (.879-1.09)	1.00 (.896-1.09)	1.55 (1.39-1.72)	2.46 (2.24-2.86)	3.53 (2.96-4.21)	1397
Females (2015 - 2016)	1.13 (1.06-1.21)	1.10 (1.02-1.20)	1.82 (1.64-2.00)	3.03 (2.71-3.24)	4.34 (3.75-4.77)	1500
Mexican Americans (2013 - 2014)	.782 (.700-.875)	.753 (.683-.875)	1.42 (1.17-1.70)	2.26 (2.00-2.61)	3.10 (2.61-3.62)	438
Mexican Americans (2015 - 2016)	.981 (.895-1.08)	1.00 (.886-1.07)	1.69 (1.47-1.82)	3.04 (2.61-3.70)	4.34 (3.91-5.41)	595
Non-Hispanic blacks (2013 - 2014)	.697 (.655-.741)	.694 (.650-.737)	1.21 (1.09-1.29)	1.84 (1.55-2.11)	2.46 (2.05-3.19)	608
Non-Hispanic blacks (2015 - 2016)	.841 (.763-.928)	.728 (.667-.853)	1.53 (1.32-1.82)	2.88 (2.56-3.62)	4.67 (3.90-6.71)	697
Non-Hispanic whites (2013 - 2014)	.849 (.737-.977)	.864 (.734-.994)	1.33 (1.21-1.56)	2.30 (2.04-2.80)	3.41 (2.64-4.44)	986
Non-Hispanic whites (2015 - 2016)	.934 (.880-.990)	.916 (.866-1.00)	1.61 (1.45-1.74)	2.55 (2.28-3.02)	3.58 (3.11-4.13)	862
All Hispanics (2013 - 2014)	.788 (.715-.868)	.757 (.690-.863)	1.43 (1.25-1.58)	2.26 (2.00-2.56)	3.21 (2.74-3.51)	690
All Hispanics (2015 - 2016)	.966 (.916-1.02)	.933 (.865-1.01)	1.65 (1.47-1.77)	2.90 (2.55-3.33)	4.24 (3.83-4.86)	971
Asians (2013 - 2014)	.866 (.764-.981)	.854 (.700-.986)	1.56 (1.27-1.73)	2.26 (2.03-2.90)	3.14 (2.53-4.02)	286
Asians (2015 - 2016)	1.03 (.869-1.22)	1.03 (.855-1.12)	1.63 (1.31-2.10)	2.83 (2.20-4.68)	4.81 (3.47-5.30)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-butyl phthalate (MnBP) (1999 – 2010)

CAS Number 131-70-4

Metabolite of Dibutyl phthalate (DBP) and Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.*

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	24.6 (22.1-27.4)	26.0 (23.6-29.2)	51.6 (44.5-60.3)	98.6 (90.2-114)	150 (121-169)	2541
Total population (2001 - 2002)	18.9 (17.4-20.6)	20.4 (19.2-21.8)	40.4 (36.5-44.2)	73.6 (65.3-85.6)	108 (94.1-122)	2782
Total population (2003 - 2004)	21.1 (19.8-22.5)	23.2 (21.2-24.8)	42.7 (38.5-47.2)	80.7 (70.2-93.9)	122 (104-137)	2605
Total population (2005 - 2006)	19.6 (18.2-21.3)	20.6 (18.6-23.0)	40.4 (36.4-44.9)	71.5 (66.5-79.5)	107 (96.3-124)	2548
Total population (2007 - 2008)	18.9 (17.2-20.7)	20.0 (18.1-21.9)	39.1 (34.5-43.4)	72.4 (64.5-77.7)	110 (94.5-120)	2604
Total population (2009 - 2010)	14.6 (13.2-16.2)	15.9 (14.3-17.3)	30.5 (27.2-33.3)	54.4 (49.7-59.1)	75.9 (67.5-86.8)	2749
Age 6-11 years (1999 - 2000)	41.4 (35.6-48.0)	40.0 (36.2-49.2)	75.5 (59.1-92.8)	124 (98.4-159)	166 (127-279)	328
Age 6-11 years (2001 - 2002)	31.1 (26.6-36.5)	32.4 (25.6-37.1)	62.1 (51.3-76.9)	107 (84.3-136)	159 (110-290)	393
Age 6-11 years (2003 - 2004)	36.3 (30.7-42.9)	36.7 (28.5-47.5)	71.3 (56.9-87.2)	137 (107-162)	191 (150-243)	342
Age 6-11 years (2005 - 2006)	30.5 (27.5-33.8)	32.3 (27.8-35.0)	57.4 (46.8-65.4)	93.4 (75.6-130)	136 (108-181)	356
Age 6-11 years (2007 - 2008)	26.9 (22.5-32.1)	28.7 (21.3-38.0)	53.6 (45.6-63.6)	85.6 (71.4-102)	119 (91.6-150)	389
Age 6-11 years (2009 - 2010)	21.7 (19.0-24.8)	23.3 (20.8-26.2)	44.9 (39.1-49.7)	83.8 (59.6-121)	124 (92.3-173)	415
Age 12-19 years (1999 - 2000)	36.0 (30.8-42.1)	36.3 (30.6-44.9)	68.6 (55.9-79.7)	119 (90.2-159)	165 (121-227)	752
Age 12-19 years (2001 - 2002)	25.1 (21.6-29.2)	26.7 (22.0-32.7)	52.6 (48.4-60.4)	92.4 (72.7-121)	148 (106-185)	742
Age 12-19 years (2003 - 2004)	26.7 (24.1-29.5)	28.2 (25.2-33.1)	52.0 (45.3-60.9)	97.5 (74.7-116)	134 (110-158)	729
Age 12-19 years (2005 - 2006)	27.5 (24.3-31.3)	29.0 (23.7-36.6)	57.2 (48.7-64.9)	88.6 (75.1-105)	125 (96.2-154)	702
Age 12-19 years (2007 - 2008)	26.2 (22.5-30.6)	27.3 (22.1-32.8)	51.7 (46.2-63.8)	111 (77.7-132)	149 (103-188)	401
Age 12-19 years (2009 - 2010)	18.9 (16.1-22.2)	22.3 (19.4-24.4)	37.2 (31.3-43.4)	61.7 (52.8-73.2)	81.4 (68.9-86.3)	420
Age 20+ years (1999 - 2000)	21.6 (19.0-24.5)	23.1 (19.7-26.1)	46.3 (36.9-53.6)	95.0 (78.7-111)	143 (117-161)	1461
Age 20+ years (2001 - 2002)	17.0 (15.4-18.8)	19.1 (17.1-20.4)	35.1 (31.6-40.2)	64.8 (57.3-79.7)	95.4 (84.6-113)	1647
Age 20+ years (2003 - 2004)	19.0 (17.7-20.5)	20.7 (18.9-22.9)	38.4 (35.7-42.7)	74.7 (64.1-82.6)	108 (90.7-127)	1534
Age 20+ years (2005 - 2006)	17.7 (16.0-19.6)	18.4 (16.6-20.6)	36.7 (32.5-41.4)	65.1 (55.4-74.3)	101 (84.3-121)	1490
Age 20+ years (2007 - 2008)	17.2 (15.6-19.1)	18.6 (16.7-20.3)	34.5 (31.5-39.1)	63.8 (56.4-72.5)	98.3 (83.0-115)	1814
Age 20+ years (2009 - 2010)	13.5 (12.0-15.1)	14.5 (13.0-16.0)	28.1 (24.1-32.0)	50.0 (44.1-56.1)	68.9 (60.6-77.3)	1914
Males (1999 - 2000)	22.0 (20.1-24.1)	23.2 (20.4-26.3)	43.1 (36.6-49.5)	84.4 (71.3-96.2)	116 (97.8-132)	1215
Males (2001 - 2002)	17.7 (16.0-19.6)	19.3 (17.3-21.0)	34.5 (30.3-40.6)	62.1 (54.1-75.5)	95.2 (75.5-117)	1371
Males (2003 - 2004)	20.0 (18.1-22.0)	21.1 (19.0-24.0)	39.4 (35.5-43.4)	65.5 (59.0-73.0)	95.9 (79.8-111)	1250
Males (2005 - 2006)	19.8 (18.4-21.4)	20.7 (19.0-23.0)	38.5 (34.6-42.0)	63.8 (56.8-72.0)	96.2 (79.0-113)	1270
Males (2007 - 2008)	18.4 (16.8-20.3)	19.0 (17.3-21.3)	36.0 (32.5-40.4)	60.9 (52.8-68.8)	88.3 (72.6-110)	1294
Males (2009 - 2010)	14.5 (13.0-16.3)	15.4 (13.7-16.9)	28.4 (25.9-31.2)	51.7 (44.3-54.8)	68.9 (58.9-78.0)	1399
Females (1999 - 2000)	27.3 (23.6-31.5)	30.0 (25.9-33.3)	59.7 (51.6-69.6)	120 (98.3-145)	167 (143-223)	1326
Females (2001 - 2002)	20.2 (18.2-22.4)	21.7 (19.7-24.3)	46.7 (43.1-51.1)	85.0 (72.7-92.5)	121 (106-136)	1411
Females (2003 - 2004)	22.2 (21.2-23.3)	24.4 (23.4-25.8)	47.3 (42.7-53.0)	95.9 (79.9-114)	137 (122-156)	1355
Females (2005 - 2006)	19.5 (17.2-22.0)	20.4 (17.1-24.7)	42.3 (36.7-52.0)	83.2 (71.0-90.2)	124 (101-137)	1278
Females (2007 - 2008)	19.3 (17.2-21.7)	20.8 (18.1-23.2)	42.5 (35.6-50.6)	83.7 (68.6-109)	132 (109-151)	1310
Females (2009 - 2010)	14.7 (13.1-16.5)	16.4 (13.9-19.3)	32.7 (29.9-37.1)	57.7 (52.7-63.9)	86.2 (68.9-113)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.9, 1.1, 0.4, 0.6, 0.6, and 0.4 respectively.

*In the 1999-2000 survey period, concentrations of mono-isobutyl and mono-n-butyl phthalates were measured together and expressed as the combined value, monobutyl phthalate (MBP)

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-butyl phthalate (MnBP) (1999 – 2010)

CAS Number 131-70-4

Metabolite of Dibutyl phthalate (DBP) and Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.*

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	23.4 (21.8-25.1)	26.3 (23.9-28.1)	48.1 (41.2-56.7)	92.2 (78.9-101)	117 (104-131)	814
Mexican Americans (2001 - 2002)	20.1 (16.6-24.5)	23.1 (18.0-26.5)	42.1 (34.0-51.5)	77.1 (62.9-92.5)	112 (84.6-143)	677
Mexican Americans (2003 - 2004)	24.1 (19.8-29.5)	26.9 (20.2-32.0)	47.4 (38.0-58.5)	85.6 (61.7-117)	127 (99.8-165)	652
Mexican Americans (2005 - 2006)	22.4 (18.6-27.0)	23.5 (19.0-29.0)	45.4 (37.1-55.4)	90.2 (71.1-119)	132 (106-174)	637
Mexican Americans (2007 - 2008)	22.2 (18.5-26.7)	22.4 (17.8-27.1)	43.8 (36.2-50.4)	76.4 (59.8-106)	145 (85.6-223)	531
Mexican Americans (2009 - 2010)	17.2 (15.3-19.4)	17.3 (14.3-20.9)	34.3 (31.4-38.8)	56.1 (47.7-67.9)	80.0 (65.1-107)	566
Non-Hispanic blacks (1999 - 2000)	37.0 (31.9-42.9)	38.7 (33.4-44.5)	78.2 (58.7-91.8)	118 (108-143)	167 (143-197)	603
Non-Hispanic blacks (2001 - 2002)	29.6 (26.6-33.1)	31.5 (28.7-34.1)	58.3 (51.2-63.4)	93.2 (79.5-121)	138 (110-184)	703
Non-Hispanic blacks (2003 - 2004)	30.1 (28.4-31.9)	31.5 (29.7-34.1)	64.1 (58.3-67.1)	106 (94.8-119)	144 (115-168)	699
Non-Hispanic blacks (2005 - 2006)	27.1 (23.1-31.8)	28.5 (25.0-31.2)	53.1 (39.9-65.8)	105 (77.3-135)	143 (118-183)	678
Non-Hispanic blacks (2007 - 2008)	25.0 (21.9-28.4)	25.8 (22.0-30.4)	52.4 (43.9-59.5)	91.2 (75.6-106)	114 (96.8-148)	597
Non-Hispanic blacks (2009 - 2010)	21.9 (19.2-25.0)	23.2 (20.0-26.3)	42.4 (37.1-47.5)	69.1 (59.4-84.2)	103 (74.8-134)	516
Non-Hispanic whites (1999 - 2000)	21.8 (19.3-24.6)	23.2 (19.5-27.5)	46.3 (37.5-53.3)	90.2 (74.7-106)	142 (111-161)	912
Non-Hispanic whites (2001 - 2002)	17.6 (16.0-19.3)	19.2 (17.0-21.0)	36.6 (32.4-42.6)	69.2 (59.2-87.6)	107 (89.8-123)	1216
Non-Hispanic whites (2003 - 2004)	18.9 (17.6-20.3)	20.7 (18.9-22.8)	38.4 (35.5-42.7)	71.3 (60.1-80.0)	101 (90.7-124)	1088
Non-Hispanic whites (2005 - 2006)	17.8 (16.2-19.5)	18.6 (16.9-20.7)	37.8 (33.1-42.1)	65.4 (55.4-73.9)	95.9 (79.5-113)	1038
Non-Hispanic whites (2007 - 2008)	17.8 (16.2-19.5)	18.9 (17.2-20.9)	36.7 (32.3-41.4)	68.0 (58.9-77.2)	110 (86.5-120)	1077
Non-Hispanic whites (2009 - 2010)	13.0 (11.6-14.5)	14.1 (12.7-15.8)	26.6 (23.4-31.0)	48.8 (42.2-54.3)	67.5 (57.6-76.5)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.9, 1.1, 0.4, 0.6, 0.6, and 0.4 respectively.

*In the 1999-2000 survey period, concentrations of mono-isobutyl and mono-n-butyl phthalates were measured together and expressed as the combined value, monobutyl phthalate (MBP)

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-butyl phthalate (MnBP) (2011 – 2016)

CAS Number 131-70-4

Metabolite of Dibutyl phthalate (DBP) and Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	7.61 (6.64-8.72)	9.20 (8.10-10.1)	20.0 (17.8-22.1)	35.5 (31.3-41.8)	55.0 (44.3-68.5)	2489
Total population (2013 - 2014)	9.08 (8.53-9.66)	10.2 (9.40-11.2)	19.9 (18.1-21.0)	35.1 (32.4-37.9)	49.2 (45.7-54.0)	2685
Total population (2015 - 2016)	9.83 (8.90-10.9)	10.6 (9.70-11.9)	19.7 (18.3-21.1)	33.6 (31.7-37.0)	45.0 (42.3-51.3)	2975
Age 3-5 years (2015 - 2016)	10.9 (9.92-11.9)	11.1 (9.30-13.0)	20.6 (17.3-24.1)	35.9 (29.9-47.4)	56.1 (43.6-73.8)	465
Age 6-11 years (2011 - 2012)	11.1 (8.73-14.2)	14.9 (10.8-17.1)	25.7 (23.2-32.1)	58.6 (39.6-71.4)	97.0 (59.3-163)	396
Age 6-11 years (2013 - 2014)	12.0 (10.1-14.2)	13.1 (10.5-15.3)	26.9 (22.1-32.2)	45.3 (36.5-51.7)	55.5 (46.7-63.0)	409
Age 6-11 years (2015 - 2016)	14.4 (13.1-15.8)	15.4 (13.4-17.3)	26.2 (22.1-29.1)	40.6 (36.0-43.0)	47.2 (42.5-62.1)	415
Age 12-19 years (2011 - 2012)	9.69 (7.91-11.9)	12.2 (10.0-14.7)	24.7 (21.0-30.7)	44.2 (36.1-56.9)	60.7 (51.3-83.4)	388
Age 12-19 years (2013 - 2014)	12.1 (11.2-13.1)	13.6 (12.4-14.8)	24.5 (20.6-27.7)	45.7 (30.5-57.1)	61.0 (46.0-64.9)	462
Age 12-19 years (2015 - 2016)	11.6 (8.96-14.9)	12.2 (10.1-16.2)	22.0 (18.4-28.1)	37.9 (31.3-45.7)	51.6 (42.4-59.9)	405
Age 20+ years (2011 - 2012)	7.04 (6.04-8.21)	8.20 (7.20-9.60)	18.2 (15.7-20.7)	31.8 (27.3-38.3)	46.4 (37.7-64.3)	1705
Age 20+ years (2013 - 2014)	8.44 (7.84-9.10)	9.40 (8.70-10.2)	18.0 (17.0-19.7)	32.4 (29.0-35.1)	46.6 (38.9-52.3)	1814
Age 20+ years (2015 - 2016)	9.18 (8.32-10.1)	9.80 (9.20-11.1)	18.7 (17.0-20.4)	32.5 (29.7-35.3)	44.1 (41.0-47.8)	1690
Males (2011 - 2012)	8.14 (7.03-9.43)	9.20 (8.50-10.1)	20.1 (17.6-23.2)	34.0 (29.7-43.1)	56.9 (38.5-75.1)	1259
Males (2013 - 2014)	9.43 (8.56-10.4)	10.3 (9.30-11.4)	19.7 (17.5-21.5)	32.4 (28.8-36.9)	46.8 (38.9-53.0)	1285
Males (2015 - 2016)	9.88 (8.84-11.1)	10.6 (9.50-12.2)	19.6 (17.7-21.6)	32.0 (29.0-34.5)	44.9 (39.4-51.6)	1474
Females (2011 - 2012)	7.14 (6.05-8.41)	9.00 (7.10-10.6)	19.7 (17.5-21.9)	36.1 (30.3-43.1)	51.8 (44.3-68.0)	1230
Females (2013 - 2014)	8.76 (7.89-9.73)	10.1 (9.10-11.6)	20.1 (17.2-22.5)	36.9 (32.9-42.7)	51.0 (44.7-59.1)	1400
Females (2015 - 2016)	9.78 (8.77-10.9)	10.6 (9.60-11.9)	19.7 (17.5-21.9)	36.6 (33.1-40.4)	45.8 (42.0-54.0)	1501
Mexican Americans (2011 - 2012)	8.96 (7.58-10.6)	10.1 (7.70-13.1)	20.6 (15.2-26.4)	35.8 (29.1-45.4)	50.3 (38.9-83.4)	316
Mexican Americans (2013 - 2014)	9.81 (8.41-11.4)	10.4 (8.40-13.6)	18.7 (15.2-23.9)	36.2 (23.6-53.5)	54.0 (43.6-64.9)	438
Mexican Americans (2015 - 2016)	9.86 (8.75-11.1)	10.6 (8.70-12.3)	20.2 (16.8-22.9)	35.3 (28.7-44.4)	50.6 (42.4-66.3)	595
Non-Hispanic blacks (2011 - 2012)	13.2 (11.2-15.6)	15.3 (13.3-17.9)	29.7 (26.4-32.8)	53.1 (43.6-67.3)	76.4 (60.3-100)	665
Non-Hispanic blacks (2013 - 2014)	11.8 (10.4-13.4)	13.1 (11.4-15.1)	26.0 (23.7-27.9)	43.8 (38.3-49.2)	58.9 (48.8-68.8)	609
Non-Hispanic blacks (2015 - 2016)	13.7 (11.9-15.6)	14.4 (12.3-17.0)	26.1 (23.1-28.8)	45.0 (40.0-52.2)	67.3 (51.4-92.5)	698
Non-Hispanic whites (2011 - 2012)	6.47 (5.66-7.39)	7.60 (6.70-8.50)	17.1 (15.2-18.4)	30.3 (25.9-33.4)	43.1 (32.3-59.3)	813
Non-Hispanic whites (2013 - 2014)	8.40 (7.76-9.09)	9.40 (8.20-11.2)	18.0 (16.5-21.0)	32.4 (28.1-36.7)	46.8 (37.9-53.1)	987
Non-Hispanic whites (2015 - 2016)	9.05 (7.99-10.3)	9.80 (9.10-11.3)	18.3 (16.9-19.8)	32.0 (29.0-35.6)	41.6 (37.9-45.8)	862
All Hispanics (2011 - 2012)	9.78 (8.15-11.7)	11.0 (8.80-14.4)	23.3 (20.0-27.0)	38.9 (31.8-50.6)	60.5 (45.4-93.3)	571
All Hispanics (2013 - 2014)	9.91 (8.98-10.9)	10.5 (9.40-11.8)	19.3 (16.1-23.6)	38.2 (30.3-49.7)	59.5 (48.8-75.0)	690
All Hispanics (2015 - 2016)	9.98 (9.11-10.9)	11.0 (9.90-12.0)	19.5 (17.6-21.8)	34.6 (31.1-38.6)	48.7 (42.5-53.2)	971
Asians (2011 - 2012)	6.77 (5.05-9.06)	8.20 (5.80-10.8)	18.9 (13.5-29.1)	40.5 (29.1-58.6)	64.3 (45.9-104)	352
Asians (2013 - 2014)	8.29 (6.86-10.0)	9.40 (6.60-12.3)	18.3 (14.0-22.2)	31.5 (25.2-35.7)	41.3 (34.2-51.6)	289
Asians (2015 - 2016)	9.81 (8.06-11.9)	10.2 (7.70-13.7)	19.9 (17.5-22.4)	34.2 (28.1-47.2)	57.4 (43.1-71.9)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.4, 0.4, and 0.4, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-butyl phthalate (MnBP) (creatinine corrected) (1999 – 2010)

CAS Number 131-70-4

Metabolite of Dibutyl phthalate (DBP) and Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.*

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	22.4 (20.6-24.4)	21.9 (19.8-24.3)	38.9 (35.0-41.8)	68.3 (60.3-78.3)	97.7 (81.4-131)	2541
Total population (2001 - 2002)	17.8 (16.7-19.0)	17.4 (16.3-18.4)	30.3 (28.1-32.3)	52.4 (47.4-61.0)	81.3 (71.0-92.5)	2782
Total population (2003 - 2004)	19.8 (18.5-21.2)	19.3 (17.7-20.8)	33.9 (30.9-38.5)	59.0 (52.9-68.1)	91.6 (74.1-115)	2605
Total population (2005 - 2006)	19.2 (18.0-20.4)	18.3 (16.8-19.8)	30.8 (29.0-33.0)	50.8 (47.8-56.6)	77.8 (67.2-94.8)	2548
Total population (2007 - 2008)	19.0 (17.7-20.5)	18.8 (17.2-20.0)	31.4 (28.7-34.1)	52.0 (46.4-59.5)	77.1 (64.2-88.6)	2604
Total population (2009 - 2010)	15.3 (14.0-16.6)	14.4 (13.4-15.8)	23.6 (21.7-25.2)	38.7 (34.1-45.8)	57.4 (49.8-69.9)	2749
Age 6-11 years (1999 - 2000)	41.9 (37.4-47.1)	39.1 (34.3-49.0)	65.9 (56.7-80.0)	108 (71.2-179)	159 (102-263)	328
Age 6-11 years (2001 - 2002)	35.4 (31.7-39.6)	35.1 (29.3-38.9)	55.4 (50.1-62.3)	84.0 (69.0-113)	147 (93.8-235)	393
Age 6-11 years (2003 - 2004)	38.4 (33.8-43.6)	39.0 (34.7-42.6)	59.3 (52.9-68.1)	104 (83.6-119)	137 (108-198)	342
Age 6-11 years (2005 - 2006)	33.6 (30.8-36.6)	33.9 (30.6-37.4)	50.6 (45.0-58.3)	78.5 (66.8-111)	128 (73.4-172)	356
Age 6-11 years (2007 - 2008)	33.1 (27.6-39.7)	34.2 (27.5-41.3)	51.9 (42.6-63.8)	81.8 (61.3-101)	109 (83.1-159)	389
Age 6-11 years (2009 - 2010)	28.3 (25.0-32.0)	26.7 (24.0-31.1)	47.8 (39.4-53.9)	78.6 (59.8-101)	130 (98.9-156)	415
Age 12-19 years (1999 - 2000)	24.3 (21.2-27.8)	23.7 (20.6-27.4)	37.6 (31.6-43.8)	63.3 (52.4-76.4)	88.1 (61.5-142)	752
Age 12-19 years (2001 - 2002)	19.4 (17.3-21.7)	20.3 (17.5-22.3)	34.9 (30.5-37.9)	53.4 (45.2-73.9)	89.7 (60.3-106)	742
Age 12-19 years (2003 - 2004)	20.0 (18.7-21.3)	19.8 (18.2-21.7)	30.7 (27.9-34.8)	52.7 (43.4-65.4)	74.4 (56.0-90.9)	729
Age 12-19 years (2005 - 2006)	20.5 (19.0-22.2)	21.2 (18.8-22.9)	31.9 (29.6-33.8)	49.3 (42.1-56.4)	70.2 (52.0-108)	702
Age 12-19 years (2007 - 2008)	20.4 (18.4-22.6)	21.9 (18.7-25.7)	33.8 (30.0-38.5)	50.7 (42.4-64.0)	72.4 (50.7-84.5)	401
Age 12-19 years (2009 - 2010)	15.2 (13.8-16.8)	15.3 (13.8-18.4)	22.5 (21.1-24.8)	31.8 (28.2-34.6)	42.3 (33.8-51.2)	420
Age 20+ years (1999 - 2000)	20.4 (18.6-22.4)	19.5 (18.1-21.4)	34.9 (30.3-40.0)	62.4 (53.4-72.1)	91.0 (70.4-135)	1461
Age 20+ years (2001 - 2002)	16.1 (15.0-17.3)	15.5 (14.2-16.5)	26.3 (24.2-28.6)	44.2 (38.7-51.1)	71.6 (61.2-85.6)	1647
Age 20+ years (2003 - 2004)	18.3 (17.0-19.6)	17.7 (16.6-19.2)	31.0 (27.4-34.0)	53.3 (46.5-64.2)	83.8 (65.3-114)	1534
Age 20+ years (2005 - 2006)	17.8 (16.4-19.2)	16.8 (15.6-18.4)	28.1 (25.3-30.9)	46.1 (41.5-53.0)	74.3 (55.4-94.8)	1490
Age 20+ years (2007 - 2008)	17.7 (16.3-19.2)	17.2 (15.7-18.8)	28.2 (25.8-30.5)	46.7 (42.0-53.3)	71.8 (57.8-89.5)	1814
Age 20+ years (2009 - 2010)	14.3 (13.0-15.7)	13.5 (12.5-14.8)	21.6 (20.0-23.8)	34.5 (30.1-40.2)	50.9 (42.2-67.7)	1914
Males (1999 - 2000)	17.3 (16.1-18.6)	17.0 (15.5-18.8)	28.6 (25.8-32.1)	49.3 (42.6-53.5)	64.7 (57.3-71.5)	1215
Males (2001 - 2002)	14.4 (13.5-15.4)	13.7 (12.9-14.9)	22.9 (20.8-24.6)	39.9 (35.6-44.0)	60.0 (50.5-76.2)	1371
Males (2003 - 2004)	15.7 (14.5-16.9)	14.8 (13.6-16.0)	25.4 (23.6-28.1)	41.4 (37.0-47.5)	59.4 (50.3-81.5)	1250
Males (2005 - 2006)	15.9 (15.1-16.8)	15.4 (14.2-16.4)	24.9 (23.1-27.0)	38.6 (35.7-42.3)	51.2 (46.1-63.5)	1270
Males (2007 - 2008)	15.5 (14.4-16.8)	14.7 (13.4-16.3)	24.9 (22.6-27.6)	40.8 (35.2-44.9)	55.2 (46.1-65.2)	1294
Males (2009 - 2010)	13.0 (12.0-14.2)	12.8 (11.7-13.6)	19.9 (18.1-21.2)	30.3 (28.4-33.2)	45.3 (39.7-53.8)	1399
Females (1999 - 2000)	28.6 (25.3-32.3)	28.8 (25.5-30.5)	50.6 (41.9-56.3)	84.3 (69.2-106)	134 (93.6-155)	1326
Females (2001 - 2002)	21.7 (19.6-23.9)	21.6 (19.7-23.6)	35.8 (33.0-38.7)	64.9 (58.9-70.2)	91.5 (81.4-103)	1411
Females (2003 - 2004)	24.8 (22.9-26.8)	24.1 (21.6-26.8)	42.9 (39.2-48.9)	74.9 (64.2-86.6)	117 (83.6-139)	1355
Females (2005 - 2006)	22.9 (20.9-25.1)	21.5 (19.4-24.6)	37.1 (33.3-41.9)	67.2 (56.8-74.4)	99.6 (77.8-128)	1278
Females (2007 - 2008)	23.1 (21.0-25.5)	22.8 (20.9-25.2)	38.0 (32.7-43.1)	62.7 (52.1-78.5)	89.8 (76.2-126)	1310
Females (2009 - 2010)	17.8 (16.0-19.7)	17.6 (15.1-19.4)	27.1 (24.4-30.3)	47.8 (37.9-53.8)	70.6 (53.8-91.5)	1350

*In the 1999-2000 survey period, concentrations of mono-isobutyl and mono-n-butyl phthalates were measured together and expressed as the combined value, monobutyl phthalate (MBP)

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-butyl phthalate (MnBP) (creatinine corrected) (1999 – 2010)

CAS Number 131-70-4

Metabolite of Dibutyl phthalate (DBP) and Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.*

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	21.2 (19.3-23.3)	20.0 (18.2-22.9)	40.1 (32.6-44.3)	63.6 (57.5-70.1)	82.9 (73.9-100)	814
Mexican Americans (2001 - 2002)	19.0 (16.2-22.2)	19.2 (16.3-21.9)	33.7 (28.3-39.6)	61.0 (43.9-84.0)	86.7 (60.6-128)	677
Mexican Americans (2003 - 2004)	21.8 (17.7-26.8)	20.4 (17.4-24.0)	37.6 (29.6-50.1)	75.3 (55.6-92.0)	96.3 (76.4-164)	652
Mexican Americans (2005 - 2006)	20.1 (17.8-22.8)	19.1 (16.4-23.0)	34.3 (29.2-42.6)	64.8 (54.6-75.9)	98.1 (70.2-154)	637
Mexican Americans (2007 - 2008)	21.7 (17.7-26.5)	20.9 (16.4-27.1)	36.9 (29.1-46.7)	59.5 (47.1-88.9)	102 (63.4-161)	531
Mexican Americans (2009 - 2010)	17.1 (15.5-18.8)	15.0 (14.0-16.3)	27.4 (23.6-31.6)	51.0 (42.9-69.6)	88.1 (59.8-100)	566
Non-Hispanic blacks (1999 - 2000)	23.9 (21.3-26.8)	25.0 (20.7-28.1)	42.2 (35.9-49.6)	70.0 (61.1-83.9)	96.2 (83.9-105)	603
Non-Hispanic blacks (2001 - 2002)	20.8 (18.8-23.1)	20.2 (19.2-22.8)	34.5 (30.9-36.8)	62.8 (50.6-74.6)	85.6 (72.1-99.0)	703
Non-Hispanic blacks (2003 - 2004)	21.4 (19.5-23.4)	22.0 (19.6-24.8)	35.4 (31.6-42.7)	65.7 (54.0-75.3)	94.0 (71.1-128)	699
Non-Hispanic blacks (2005 - 2006)	19.1 (16.4-22.1)	18.5 (16.2-20.7)	30.1 (24.9-39.5)	54.6 (42.0-81.3)	84.7 (51.3-125)	678
Non-Hispanic blacks (2007 - 2008)	19.4 (17.3-21.7)	19.2 (16.8-22.0)	30.5 (27.0-36.5)	50.7 (42.8-60.4)	78.3 (59.3-125)	597
Non-Hispanic blacks (2009 - 2010)	15.9 (14.5-17.4)	15.3 (13.5-18.6)	24.9 (22.6-27.2)	37.6 (33.8-45.4)	51.2 (44.7-70.6)	516
Non-Hispanic whites (1999 - 2000)	21.3 (19.1-23.8)	20.5 (18.6-23.2)	36.4 (31.5-41.0)	67.1 (56.7-78.4)	97.7 (73.5-142)	912
Non-Hispanic whites (2001 - 2002)	17.4 (16.2-18.6)	16.5 (15.3-17.8)	29.0 (26.6-32.2)	51.1 (46.0-60.0)	81.4 (68.1-99.0)	1216
Non-Hispanic whites (2003 - 2004)	18.6 (17.3-20.1)	17.9 (16.7-19.8)	31.6 (27.7-37.8)	53.3 (48.2-61.5)	81.5 (64.2-108)	1088
Non-Hispanic whites (2005 - 2006)	18.7 (17.5-19.9)	17.9 (16.3-19.5)	29.7 (27.5-32.0)	48.7 (42.2-55.4)	74.3 (58.3-94.5)	1038
Non-Hispanic whites (2007 - 2008)	18.5 (17.3-19.9)	18.1 (16.6-19.6)	30.4 (27.3-33.3)	50.9 (43.6-61.0)	75.8 (62.6-88.0)	1077
Non-Hispanic whites (2009 - 2010)	14.6 (13.5-15.7)	13.9 (13.2-15.0)	22.1 (20.3-24.2)	35.3 (30.9-40.6)	52.5 (45.8-63.0)	1206

*In the 1999-2000 survey period, concentrations of mono-isobutyl and mono-n-butyl phthalates were measured together and expressed as the combined value, monobutyl phthalate (MBP)

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-butyl phthalate (MnBP) (creatinine corrected) (2011 – 2016)

CAS Number 131-70-4

Metabolite of Dibutyl phthalate (DBP) and Benzylbutyl phthalate (BzBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	8.66 (7.79-9.62)	9.04 (8.30-9.92)	15.8 (15.0-17.3)	27.9 (24.2-30.9)	41.2 (33.0-51.8)	2487
Total population (2013 - 2014)	9.10 (8.56-9.69)	9.17 (8.62-9.63)	14.9 (14.1-15.5)	23.8 (21.8-26.3)	34.4 (30.5-39.5)	2684
Total population (2015 - 2016)	10.2 (9.53-10.9)	9.91 (9.11-10.6)	16.7 (15.7-17.6)	26.4 (25.2-28.9)	36.1 (34.2-38.0)	2974
Age 3-5 years (2015 - 2016)	25.9 (23.8-28.1)	26.1 (23.8-29.2)	38.1 (34.1-43.0)	58.1 (52.5-72.4)	82.8 (67.6-103)	464
Age 6-11 years (2011 - 2012)	15.9 (13.0-19.5)	17.7 (15.0-20.6)	29.8 (24.8-34.4)	51.2 (38.4-66.4)	73.3 (47.3-114)	395
Age 6-11 years (2013 - 2014)	15.1 (13.4-17.1)	14.8 (13.0-17.8)	26.3 (22.2-28.8)	42.2 (31.5-53.2)	56.2 (43.1-77.1)	409
Age 6-11 years (2015 - 2016)	18.5 (17.4-19.7)	18.6 (17.2-19.8)	26.3 (24.6-28.9)	40.1 (35.5-44.3)	58.2 (44.3-78.9)	415
Age 12-19 years (2011 - 2012)	9.44 (8.71-10.2)	10.5 (8.61-12.7)	15.7 (14.9-17.8)	28.1 (22.0-30.0)	37.0 (29.2-46.7)	388
Age 12-19 years (2013 - 2014)	9.82 (8.79-11.0)	9.93 (8.95-10.3)	15.0 (13.8-16.8)	22.2 (18.3-30.6)	34.1 (22.2-60.4)	462
Age 12-19 years (2015 - 2016)	8.98 (7.71-10.5)	8.78 (7.59-9.94)	15.2 (12.1-18.4)	22.8 (19.2-26.1)	28.0 (22.1-38.2)	405
Age 20+ years (2011 - 2012)	8.00 (7.09-9.01)	8.32 (7.64-9.12)	14.6 (13.0-16.0)	23.4 (21.4-27.9)	36.2 (29.4-47.3)	1704
Age 20+ years (2013 - 2014)	8.52 (8.01-9.05)	8.62 (8.06-9.13)	13.9 (13.3-14.9)	22.2 (20.3-23.8)	30.2 (26.4-34.5)	1813
Age 20+ years (2015 - 2016)	9.36 (8.75-10.0)	9.09 (8.39-10.0)	14.8 (13.9-15.7)	24.0 (21.3-25.7)	32.9 (28.5-36.1)	1690
Males (2011 - 2012)	7.61 (6.65-8.69)	8.07 (7.54-8.85)	13.7 (11.9-15.5)	22.7 (19.3-26.3)	34.6 (24.1-53.0)	1258
Males (2013 - 2014)	7.92 (7.26-8.65)	7.67 (6.97-8.47)	13.0 (11.6-14.2)	20.3 (18.3-22.4)	28.8 (22.9-35.8)	1284
Males (2015 - 2016)	8.81 (8.18-9.50)	8.42 (7.89-8.93)	14.0 (12.8-15.4)	23.6 (21.3-25.2)	31.1 (26.6-35.0)	1474
Females (2011 - 2012)	9.81 (8.86-10.9)	10.3 (9.18-11.5)	18.1 (16.8-19.7)	31.8 (28.1-34.6)	44.8 (38.4-54.6)	1229
Females (2013 - 2014)	10.4 (9.80-11.0)	10.5 (9.67-11.3)	16.3 (15.2-17.7)	26.4 (24.1-30.1)	40.0 (33.4-45.3)	1400
Females (2015 - 2016)	11.7 (10.8-12.6)	11.6 (10.3-12.9)	19.0 (17.3-20.1)	30.2 (26.6-34.1)	39.3 (36.1-44.9)	1500
Mexican Americans (2011 - 2012)	10.1 (8.62-11.8)	10.7 (8.62-12.9)	17.6 (14.2-19.7)	32.6 (24.7-46.4)	55.9 (35.1-76.6)	316
Mexican Americans (2013 - 2014)	10.0 (8.98-11.1)	10.0 (8.38-11.3)	16.8 (14.5-19.7)	27.6 (22.4-36.7)	40.3 (30.3-45.7)	438
Mexican Americans (2015 - 2016)	10.7 (9.87-11.7)	10.4 (9.55-11.3)	18.3 (15.6-20.0)	30.0 (26.0-35.2)	46.4 (36.2-56.3)	595
Non-Hispanic blacks (2011 - 2012)	10.3 (8.80-12.0)	11.1 (9.27-12.6)	19.1 (17.0-21.5)	31.7 (25.7-37.0)	43.5 (34.0-56.0)	665
Non-Hispanic blacks (2013 - 2014)	8.71 (8.05-9.42)	8.96 (8.09-9.57)	14.7 (13.7-15.8)	24.2 (20.2-28.4)	32.0 (26.6-39.6)	609
Non-Hispanic blacks (2015 - 2016)	10.9 (9.92-11.9)	10.1 (9.01-11.4)	18.5 (15.8-21.7)	32.5 (28.0-37.7)	46.8 (39.8-62.0)	697
Non-Hispanic whites (2011 - 2012)	7.85 (6.92-8.91)	8.13 (7.43-8.99)	14.5 (13.0-15.9)	22.9 (21.4-27.9)	34.6 (27.9-46.4)	811
Non-Hispanic whites (2013 - 2014)	8.84 (8.10-9.65)	8.87 (8.01-9.58)	14.3 (13.4-15.3)	22.4 (18.7-26.4)	31.4 (25.4-44.5)	987
Non-Hispanic whites (2015 - 2016)	9.73 (8.91-10.6)	9.58 (8.59-10.5)	16.2 (14.8-17.5)	25.2 (23.2-27.2)	32.9 (29.7-36.0)	862
All Hispanics (2011 - 2012)	11.0 (9.71-12.3)	11.2 (10.3-12.5)	19.3 (15.8-24.9)	36.1 (28.8-47.4)	55.6 (42.1-65.6)	571
All Hispanics (2013 - 2014)	9.84 (8.97-10.8)	10.0 (8.65-11.3)	17.1 (14.9-18.8)	26.6 (23.1-33.4)	40.0 (30.8-42.7)	690
All Hispanics (2015 - 2016)	10.5 (9.83-11.3)	10.4 (9.82-11.0)	17.0 (15.6-19.0)	28.0 (25.2-30.9)	40.0 (33.2-48.6)	971
Asians (2011 - 2012)	9.07 (7.35-11.2)	9.84 (7.57-11.9)	19.0 (14.0-24.5)	35.6 (25.9-45.0)	46.2 (41.5-73.3)	352
Asians (2013 - 2014)	10.6 (9.16-12.2)	10.0 (8.68-12.9)	17.3 (15.0-20.8)	31.3 (24.4-38.8)	45.3 (34.5-56.5)	288
Asians (2015 - 2016)	12.1 (11.0-13.4)	11.2 (9.48-13.3)	19.7 (16.2-21.5)	36.8 (28.1-46.0)	51.8 (42.9-57.7)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isobutyl phthalate (MiBP) (2001 – 2010)

CAS Number 30833-53-5

Metabolite of Di-isobutyl phthalate (DiBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	2.71 (2.49-2.94)	2.70 (2.40-3.00)	5.70 (5.30-6.10)	12.0 (11.4-12.7)	17.9 (16.3-19.8)	2782
Total population (2003 - 2004)	3.80 (3.40-4.25)	4.20 (3.70-4.80)	8.40 (7.40-9.50)	15.0 (13.1-17.3)	21.3 (18.6-26.0)	2605
Total population (2005 - 2006)	5.20 (4.64-5.83)	5.80 (5.40-6.60)	11.9 (10.6-13.3)	21.3 (18.7-23.7)	31.6 (27.1-37.2)	2548
Total population (2007 - 2008)	7.15 (6.59-7.77)	8.00 (7.50-8.60)	15.3 (13.9-16.9)	27.2 (24.6-30.4)	39.1 (35.4-43.8)	2604
Total population (2009 - 2010)	7.64 (6.88-8.49)	8.30 (7.24-9.27)	15.8 (14.5-17.4)	27.6 (24.7-31.7)	41.3 (35.6-47.5)	2749
Age 6-11 years (2001 - 2002)	4.22 (3.28-5.43)	4.40 (3.20-6.20)	10.7 (7.30-13.4)	18.6 (14.2-22.0)	23.4 (20.4-27.8)	393
Age 6-11 years (2003 - 2004)	6.56 (5.24-8.22)	7.00 (5.10-9.10)	12.8 (9.40-17.7)	24.3 (19.6-34.5)	40.6 (29.3-48.5)	342
Age 6-11 years (2005 - 2006)	8.53 (7.67-9.48)	9.00 (8.20-10.3)	15.8 (13.7-19.2)	33.2 (27.5-38.4)	49.1 (33.2-54.4)	356
Age 6-11 years (2007 - 2008)	10.7 (8.94-12.8)	11.4 (8.90-13.2)	21.1 (16.6-27.2)	35.9 (30.2-44.7)	55.4 (36.4-75.5)	389
Age 6-11 years (2009 - 2010)	10.2 (9.10-11.4)	10.9 (9.45-12.2)	20.8 (18.8-23.6)	35.7 (28.8-46.9)	55.4 (41.2-75.4)	415
Age 12-19 years (2001 - 2002)	3.48 (2.90-4.17)	3.80 (2.90-4.40)	7.40 (6.00-9.00)	14.5 (11.7-18.6)	22.3 (16.2-33.4)	742
Age 12-19 years (2003 - 2004)	4.55 (3.73-5.55)	5.60 (4.50-6.30)	10.1 (8.00-11.4)	17.1 (13.3-20.9)	22.7 (18.5-29.1)	729
Age 12-19 years (2005 - 2006)	7.46 (6.53-8.51)	7.90 (6.90-9.80)	16.2 (13.6-19.3)	29.2 (23.6-31.3)	34.1 (30.1-49.9)	702
Age 12-19 years (2007 - 2008)	10.2 (8.53-12.3)	10.5 (8.40-12.9)	22.3 (17.0-26.9)	41.6 (32.9-48.1)	56.2 (44.6-82.7)	401
Age 12-19 years (2009 - 2010)	10.7 (9.54-12.1)	12.3 (10.7-13.6)	20.2 (17.3-22.2)	36.1 (28.3-46.0)	49.8 (42.3-60.2)	420
Age 20+ years (2001 - 2002)	2.46 (2.30-2.63)	2.40 (2.20-2.70)	5.10 (4.80-5.50)	10.6 (9.40-12.0)	16.3 (13.6-18.5)	1647
Age 20+ years (2003 - 2004)	3.46 (3.11-3.84)	3.90 (3.40-4.30)	7.50 (6.70-8.50)	13.3 (11.5-16.5)	19.9 (16.0-25.0)	1534
Age 20+ years (2005 - 2006)	4.65 (4.07-5.30)	5.40 (4.70-6.00)	10.6 (9.50-12.0)	18.7 (16.0-21.9)	29.0 (22.1-34.4)	1490
Age 20+ years (2007 - 2008)	6.47 (5.91-7.09)	7.50 (6.70-8.00)	14.1 (12.5-16.1)	24.5 (21.3-27.7)	34.2 (27.9-39.5)	1814
Age 20+ years (2009 - 2010)	7.03 (6.26-7.90)	7.55 (6.66-8.57)	14.6 (12.8-16.6)	25.7 (23.2-28.5)	38.6 (31.4-43.6)	1914
Males (2001 - 2002)	2.73 (2.50-2.97)	2.80 (2.40-3.20)	5.60 (5.00-6.10)	11.6 (10.1-12.6)	16.6 (13.6-20.1)	1371
Males (2003 - 2004)	4.07 (3.56-4.66)	4.30 (3.80-5.10)	9.20 (7.50-10.2)	16.0 (13.3-18.5)	22.7 (17.3-30.3)	1250
Males (2005 - 2006)	5.65 (5.08-6.29)	6.20 (5.60-6.90)	11.9 (10.7-13.3)	22.1 (18.7-26.5)	32.3 (25.5-39.8)	1270
Males (2007 - 2008)	7.52 (6.84-8.26)	8.30 (7.70-9.40)	15.2 (13.6-17.2)	25.0 (21.7-28.4)	38.3 (27.3-44.2)	1294
Males (2009 - 2010)	7.80 (6.96-8.74)	8.48 (7.44-9.16)	15.3 (14.0-17.0)	26.2 (23.2-30.9)	39.1 (31.1-46.4)	1399
Females (2001 - 2002)	2.68 (2.44-2.96)	2.60 (2.30-3.00)	5.80 (5.30-6.50)	12.6 (11.0-14.7)	18.7 (16.3-24.0)	1411
Females (2003 - 2004)	3.56 (3.19-3.97)	4.10 (3.50-4.50)	8.00 (7.10-9.10)	14.2 (12.5-16.6)	20.5 (17.9-23.0)	1355
Females (2005 - 2006)	4.80 (4.15-5.55)	5.50 (4.70-6.60)	11.9 (10.1-13.6)	19.6 (17.0-24.1)	29.8 (24.6-35.9)	1278
Females (2007 - 2008)	6.82 (6.21-7.49)	7.40 (6.50-8.30)	15.5 (14.5-16.9)	29.1 (27.0-32.9)	39.8 (36.2-46.7)	1310
Females (2009 - 2010)	7.50 (6.68-8.43)	8.07 (6.94-9.62)	16.4 (14.0-18.9)	29.1 (25.3-33.5)	45.0 (36.0-52.7)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.0, 0.3, 0.3, 0.3, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isobutyl phthalate (MiBP) (2001 – 2010)

CAS Number 30833-53-5

Metabolite of Di-isobutyl phthalate (DiBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	3.26 (2.72-3.91)	3.40 (2.70-4.30)	7.20 (6.20-9.30)	12.2 (11.2-14.7)	18.4 (14.1-25.6)	677
Mexican Americans (2003 - 2004)	4.81 (3.85-6.02)	5.10 (4.00-6.70)	10.2 (8.20-12.6)	18.3 (13.5-24.5)	26.0 (19.0-38.5)	652
Mexican Americans (2005 - 2006)	6.88 (5.58-8.48)	7.30 (6.00-8.90)	14.5 (11.5-17.5)	26.3 (20.7-34.1)	40.4 (33.8-46.8)	637
Mexican Americans (2007 - 2008)	9.30 (8.12-10.6)	10.2 (9.40-11.1)	17.4 (15.9-18.8)	31.9 (24.0-39.2)	47.6 (34.2-58.2)	531
Mexican Americans (2009 - 2010)	9.34 (8.22-10.6)	9.97 (8.31-11.6)	18.8 (16.0-21.8)	31.7 (25.6-37.2)	46.4 (37.3-54.0)	566
Non-Hispanic blacks (2001 - 2002)	4.90 (4.46-5.37)	5.30 (4.60-6.00)	10.7 (9.20-12.0)	18.3 (16.1-20.1)	25.5 (20.7-31.3)	703
Non-Hispanic blacks (2003 - 2004)	6.67 (5.97-7.46)	6.90 (6.30-7.50)	12.6 (10.9-14.7)	25.7 (17.7-31.0)	33.5 (27.3-43.9)	699
Non-Hispanic blacks (2005 - 2006)	8.37 (7.06-9.91)	8.70 (7.50-10.2)	16.1 (13.8-19.7)	30.1 (22.1-37.2)	41.4 (30.1-67.7)	678
Non-Hispanic blacks (2007 - 2008)	10.7 (9.08-12.5)	12.5 (10.5-14.8)	23.1 (21.7-25.0)	38.9 (32.4-43.5)	47.6 (44.5-57.0)	597
Non-Hispanic blacks (2009 - 2010)	14.0 (11.9-16.4)	15.4 (12.9-17.8)	27.5 (22.4-34.1)	47.6 (34.4-65.6)	66.0 (46.3-85.2)	516
Non-Hispanic whites (2001 - 2002)	2.33 (2.10-2.59)	2.30 (1.90-2.60)	4.90 (4.40-5.30)	9.60 (8.30-11.6)	15.6 (13.0-18.6)	1216
Non-Hispanic whites (2003 - 2004)	3.17 (2.82-3.56)	3.50 (3.00-4.00)	6.80 (5.90-7.90)	12.5 (10.6-14.5)	17.6 (14.7-20.8)	1088
Non-Hispanic whites (2005 - 2006)	4.41 (3.86-5.04)	5.00 (4.20-5.70)	10.3 (9.10-11.5)	18.7 (16.3-21.1)	28.8 (22.1-32.2)	1038
Non-Hispanic whites (2007 - 2008)	6.32 (5.78-6.93)	7.20 (6.40-7.90)	13.6 (12.4-14.9)	24.3 (20.1-27.3)	33.8 (27.0-39.5)	1077
Non-Hispanic whites (2009 - 2010)	6.34 (5.65-7.10)	6.92 (6.08-7.90)	12.9 (11.7-14.5)	21.6 (19.1-24.2)	29.6 (26.0-34.3)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.0, 0.3, 0.3, 0.3, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isobutyl phthalate (MiBP) (2011 – 2016)

CAS Number 30833-53-5

Metabolite of Di-isobutyl phthalate (DiBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	6.00 (5.41-6.65)	6.30 (5.80-6.90)	13.0 (11.9-14.5)	25.4 (22.3-29.7)	36.5 (33.4-41.0)	2489
Total population (2013 - 2014)	7.06 (6.42-7.76)	7.50 (6.60-8.60)	14.9 (13.6-16.4)	26.1 (23.1-28.7)	39.3 (33.8-45.7)	2685
Total population (2015 - 2016)	8.42 (7.57-9.37)	9.10 (8.30-9.90)	16.7 (15.1-18.2)	29.8 (26.1-33.9)	44.2 (39.3-49.3)	2975
Age 3-5 years (2015 - 2016)	9.44 (8.65-10.3)	9.60 (8.10-10.9)	17.6 (15.8-20.1)	30.8 (26.3-35.9)	53.4 (35.8-67.3)	465
Age 6-11 years (2011 - 2012)	8.28 (6.93-9.91)	9.40 (6.90-11.6)	18.6 (14.1-23.6)	31.8 (26.0-38.2)	43.1 (33.6-66.5)	396
Age 6-11 years (2013 - 2014)	9.31 (8.03-10.8)	10.2 (8.90-11.9)	18.6 (16.3-19.8)	32.3 (25.8-38.3)	44.7 (37.2-62.3)	409
Age 6-11 years (2015 - 2016)	11.2 (9.30-13.5)	11.6 (10.2-13.7)	19.6 (15.8-26.2)	39.2 (31.1-52.1)	59.7 (41.0-80.3)	415
Age 12-19 years (2011 - 2012)	7.73 (6.74-8.86)	8.10 (6.90-9.60)	19.0 (14.5-23.0)	34.2 (25.3-38.5)	43.3 (36.5-45.4)	388
Age 12-19 years (2013 - 2014)	9.73 (8.29-11.4)	10.1 (8.00-12.1)	19.7 (15.6-24.9)	39.4 (31.5-52.3)	59.3 (44.1-78.5)	462
Age 12-19 years (2015 - 2016)	10.4 (8.22-13.2)	11.7 (8.90-14.6)	21.3 (15.6-27.9)	32.3 (27.9-42.5)	43.1 (36.8-46.7)	405
Age 20+ years (2011 - 2012)	5.57 (4.92-6.31)	6.00 (5.40-6.60)	12.2 (10.6-13.6)	23.6 (19.4-27.8)	34.4 (31.1-39.2)	1705
Age 20+ years (2013 - 2014)	6.53 (5.89-7.24)	6.90 (6.30-7.90)	14.0 (12.7-15.4)	23.6 (20.8-27.0)	35.4 (28.7-42.4)	1814
Age 20+ years (2015 - 2016)	7.88 (7.09-8.75)	8.70 (7.70-9.40)	15.6 (14.0-17.5)	27.5 (25.2-31.6)	42.5 (35.8-49.0)	1690
Males (2011 - 2012)	6.54 (5.70-7.51)	6.60 (5.70-7.50)	13.6 (11.7-15.8)	27.6 (21.8-35.1)	39.3 (33.6-46.9)	1259
Males (2013 - 2014)	7.42 (6.64-8.30)	7.70 (6.60-8.90)	14.7 (13.1-16.5)	25.4 (21.7-28.7)	35.5 (29.5-43.0)	1285
Males (2015 - 2016)	8.69 (7.66-9.87)	9.50 (8.20-11.0)	16.6 (14.4-19.7)	29.4 (25.3-34.8)	43.1 (37.4-49.0)	1474
Females (2011 - 2012)	5.52 (4.95-6.15)	6.10 (5.60-6.80)	12.7 (11.3-14.5)	24.1 (21.2-26.3)	32.7 (30.2-36.5)	1230
Females (2013 - 2014)	6.73 (6.00-7.54)	7.20 (6.40-8.10)	15.0 (13.5-16.6)	26.4 (23.1-32.3)	43.1 (35.6-51.7)	1400
Females (2015 - 2016)	8.16 (7.31-9.12)	8.70 (8.00-9.30)	16.8 (15.3-18.0)	29.8 (26.3-35.6)	44.5 (39.3-53.8)	1501
Mexican Americans (2011 - 2012)	6.71 (5.77-7.82)	6.60 (5.30-8.40)	12.4 (10.5-15.2)	23.7 (15.5-31.2)	33.4 (23.7-54.7)	316
Mexican Americans (2013 - 2014)	8.79 (6.87-11.3)	8.70 (6.50-12.2)	17.4 (12.8-23.6)	32.8 (26.5-43.0)	49.3 (40.7-55.9)	438
Mexican Americans (2015 - 2016)	9.33 (8.29-10.5)	9.90 (8.90-11.5)	17.6 (16.0-19.2)	33.0 (26.3-44.2)	52.2 (40.8-70.1)	595
Non-Hispanic blacks (2011 - 2012)	9.88 (8.55-11.4)	10.4 (8.90-12.5)	19.7 (16.5-23.6)	36.5 (30.8-41.2)	49.9 (41.2-67.8)	665
Non-Hispanic blacks (2013 - 2014)	10.5 (9.44-11.6)	11.2 (9.60-12.4)	20.7 (18.2-22.9)	42.2 (34.8-47.2)	58.0 (46.1-74.6)	609
Non-Hispanic blacks (2015 - 2016)	11.7 (10.5-13.0)	11.8 (10.2-13.4)	23.0 (20.3-25.2)	38.2 (31.1-44.9)	51.6 (44.5-63.1)	698
Non-Hispanic whites (2011 - 2012)	5.23 (4.71-5.82)	5.50 (4.90-6.00)	11.7 (9.40-13.3)	23.7 (17.6-28.8)	34.2 (28.6-37.7)	813
Non-Hispanic whites (2013 - 2014)	6.12 (5.48-6.82)	6.60 (5.60-7.70)	13.6 (11.8-15.0)	22.7 (19.7-25.0)	30.2 (26.8-35.4)	987
Non-Hispanic whites (2015 - 2016)	7.60 (6.69-8.64)	8.60 (7.20-9.50)	14.7 (13.2-17.4)	26.7 (22.1-31.5)	40.5 (30.5-47.2)	862
All Hispanics (2011 - 2012)	7.22 (5.89-8.87)	7.70 (5.70-10.0)	13.7 (11.4-18.2)	24.8 (18.8-32.4)	33.4 (23.9-64.8)	571
All Hispanics (2013 - 2014)	8.90 (7.59-10.4)	8.80 (7.10-10.6)	17.5 (13.2-21.8)	32.4 (27.6-43.0)	50.5 (40.7-55.9)	690
All Hispanics (2015 - 2016)	9.35 (8.30-10.5)	9.80 (8.90-10.8)	17.6 (15.9-20.1)	33.9 (30.1-40.8)	53.8 (41.8-73.5)	971
Asians (2011 - 2012)	5.70 (4.35-7.46)	6.20 (4.30-8.70)	13.8 (9.80-21.2)	27.8 (19.9-39.3)	40.1 (27.8-65.3)	352
Asians (2013 - 2014)	6.47 (5.47-7.66)	6.50 (5.20-8.20)	13.7 (10.8-16.4)	21.5 (17.9-24.7)	26.8 (22.7-33.6)	289
Asians (2015 - 2016)	8.00 (6.88-9.31)	7.90 (6.20-10.3)	16.8 (13.4-19.4)	36.2 (24.4-42.3)	55.1 (39.8-65.6)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.2, 0.8, and 0.8, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isobutyl phthalate (MiBP) (creatinine corrected) (2001 – 2010)

CAS Number 30833-53-5

Metabolite of Di-isobutyl phthalate (DiBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	2.54 (2.36-2.73)	2.46 (2.26-2.68)	4.54 (4.20-4.86)	8.02 (7.78-8.66)	12.0 (10.8-13.5)	2782
Total population (2003 - 2004)	3.57 (3.18-4.00)	3.57 (3.15-4.08)	6.21 (5.36-7.17)	10.9 (9.47-12.7)	15.4 (12.8-18.6)	2605
Total population (2005 - 2006)	5.07 (4.68-5.50)	5.07 (4.74-5.45)	8.81 (8.08-9.55)	15.2 (13.4-16.5)	21.3 (18.3-24.3)	2548
Total population (2007 - 2008)	7.21 (6.76-7.70)	7.25 (6.77-7.81)	12.1 (11.2-13.3)	19.5 (17.2-21.5)	27.8 (24.9-31.3)	2604
Total population (2009 - 2010)	7.98 (7.34-8.68)	7.86 (7.12-8.52)	12.4 (11.2-14.1)	20.1 (17.3-23.0)	26.8 (23.7-32.8)	2749
Age 6-11 years (2001 - 2002)	4.81 (3.89-5.94)	5.18 (4.13-6.32)	9.20 (7.03-11.7)	15.2 (11.1-24.3)	24.3 (13.9-40.3)	393
Age 6-11 years (2003 - 2004)	6.94 (5.79-8.31)	7.03 (5.29-8.95)	11.8 (9.56-15.1)	18.6 (15.1-25.1)	28.7 (21.8-36.9)	342
Age 6-11 years (2005 - 2006)	9.39 (8.56-10.3)	9.46 (8.50-10.3)	15.3 (13.0-18.1)	25.2 (21.6-30.1)	37.9 (28.0-65.5)	356
Age 6-11 years (2007 - 2008)	13.2 (11.1-15.5)	12.9 (10.5-15.7)	21.9 (17.8-26.0)	35.5 (28.3-43.5)	52.6 (41.4-58.3)	389
Age 6-11 years (2009 - 2010)	13.2 (11.8-14.9)	12.6 (11.0-14.7)	20.9 (18.7-24.9)	35.3 (28.6-46.1)	53.0 (39.1-95.1)	415
Age 12-19 years (2001 - 2002)	2.68 (2.29-3.15)	2.83 (2.39-3.33)	4.79 (4.04-5.51)	7.62 (6.18-10.2)	12.8 (8.76-15.6)	742
Age 12-19 years (2003 - 2004)	3.41 (2.86-4.05)	3.69 (2.99-4.31)	5.75 (4.69-7.04)	9.32 (7.17-12.0)	13.5 (9.52-20.1)	729
Age 12-19 years (2005 - 2006)	5.56 (5.05-6.11)	5.82 (5.20-6.53)	9.05 (8.06-10.4)	14.3 (13.4-16.5)	20.3 (17.7-26.8)	702
Age 12-19 years (2007 - 2008)	7.95 (6.96-9.09)	8.30 (6.89-9.76)	13.7 (11.3-15.7)	21.3 (16.3-28.4)	28.7 (20.5-62.6)	401
Age 12-19 years (2009 - 2010)	8.63 (7.97-9.34)	8.94 (7.87-9.78)	12.7 (11.7-14.9)	19.5 (16.5-25.3)	28.8 (20.6-53.4)	420
Age 20+ years (2001 - 2002)	2.33 (2.20-2.46)	2.26 (2.08-2.43)	3.89 (3.65-4.25)	7.31 (7.00-7.78)	10.6 (9.46-11.3)	1647
Age 20+ years (2003 - 2004)	3.32 (3.00-3.68)	3.33 (3.00-3.81)	5.59 (4.93-6.51)	9.84 (8.65-11.2)	13.5 (11.4-16.0)	1534
Age 20+ years (2005 - 2006)	4.66 (4.23-5.13)	4.62 (4.36-5.03)	8.00 (7.23-8.78)	13.5 (11.6-15.7)	18.2 (16.1-23.0)	1490
Age 20+ years (2007 - 2008)	6.65 (6.21-7.12)	6.73 (6.29-7.20)	11.1 (10.2-12.1)	17.1 (15.6-18.6)	23.8 (21.0-26.7)	1814
Age 20+ years (2009 - 2010)	7.45 (6.81-8.15)	7.24 (6.69-7.89)	11.6 (10.4-12.6)	17.7 (15.1-21.9)	23.8 (20.7-28.8)	1914
Males (2001 - 2002)	2.22 (2.09-2.35)	2.18 (1.97-2.37)	3.76 (3.58-4.11)	7.38 (6.64-7.95)	11.1 (10.1-12.5)	1371
Males (2003 - 2004)	3.20 (2.80-3.66)	3.19 (2.74-3.56)	5.84 (4.79-6.56)	10.0 (8.27-12.2)	13.9 (11.5-19.1)	1250
Males (2005 - 2006)	4.54 (4.19-4.92)	4.45 (4.21-4.81)	7.95 (6.95-8.73)	13.4 (11.6-15.8)	18.5 (16.7-19.8)	1270
Males (2007 - 2008)	6.33 (5.91-6.79)	6.36 (5.93-6.77)	10.4 (9.43-11.3)	16.4 (15.0-19.7)	24.1 (21.1-27.7)	1294
Males (2009 - 2010)	6.99 (6.44-7.59)	6.70 (6.26-7.21)	10.6 (9.80-11.5)	17.5 (15.4-19.8)	23.4 (20.9-27.3)	1399
Females (2001 - 2002)	2.88 (2.61-3.18)	2.85 (2.52-3.18)	5.14 (4.67-5.89)	8.66 (8.02-10.1)	13.7 (11.1-15.0)	1411
Females (2003 - 2004)	3.96 (3.56-4.42)	4.00 (3.57-4.45)	6.73 (5.64-7.80)	11.6 (10.2-13.0)	15.7 (13.0-18.7)	1355
Females (2005 - 2006)	5.64 (5.04-6.32)	5.86 (5.39-6.39)	9.61 (8.85-10.6)	15.8 (14.3-18.1)	24.3 (18.7-32.5)	1278
Females (2007 - 2008)	8.18 (7.46-8.96)	8.70 (7.78-9.47)	13.9 (12.2-15.2)	21.3 (18.3-25.3)	31.6 (26.4-34.7)	1310
Females (2009 - 2010)	9.05 (8.22-9.97)	9.13 (8.19-9.90)	14.4 (12.2-16.2)	22.0 (18.1-26.3)	29.8 (25.8-36.4)	1350

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isobutyl phthalate (MiBP) (creatinine corrected) (2001 – 2010)

CAS Number 30833-53-5

Metabolite of Di-isobutyl phthalate (DiBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	3.07 (2.58-3.66)	2.98 (2.53-3.82)	5.82 (4.91-6.99)	10.6 (8.28-13.3)	16.0 (12.6-19.4)	677
Mexican Americans (2003 - 2004)	4.34 (3.47-5.43)	4.47 (3.53-5.24)	7.75 (6.33-9.69)	13.1 (11.9-16.8)	23.3 (17.9-26.1)	652
Mexican Americans (2005 - 2006)	6.19 (5.24-7.31)	6.17 (5.59-7.02)	10.9 (9.61-12.3)	18.6 (17.1-21.5)	28.3 (23.7-36.2)	637
Mexican Americans (2007 - 2008)	9.07 (7.87-10.5)	8.94 (8.07-10.3)	14.6 (12.4-18.0)	25.9 (21.1-32.4)	36.1 (28.0-42.3)	531
Mexican Americans (2009 - 2010)	9.27 (8.37-10.3)	8.95 (8.00-10.0)	14.6 (12.8-17.3)	25.6 (23.1-28.2)	40.6 (28.7-47.4)	566
Non-Hispanic blacks (2001 - 2002)	3.44 (3.20-3.69)	3.52 (2.95-3.81)	6.11 (5.03-7.04)	10.6 (8.94-12.4)	15.6 (12.6-19.7)	703
Non-Hispanic blacks (2003 - 2004)	4.74 (4.07-5.51)	4.65 (4.10-5.30)	7.81 (6.38-10.0)	15.2 (10.8-18.4)	19.9 (15.7-28.7)	699
Non-Hispanic blacks (2005 - 2006)	5.88 (5.12-6.76)	5.86 (5.03-7.03)	9.74 (8.21-11.3)	14.9 (12.0-19.9)	21.4 (14.9-29.7)	678
Non-Hispanic blacks (2007 - 2008)	8.28 (7.20-9.52)	8.96 (8.33-9.71)	14.4 (12.9-15.7)	21.6 (20.3-24.3)	29.6 (24.3-37.7)	597
Non-Hispanic blacks (2009 - 2010)	10.1 (8.76-11.7)	10.5 (9.41-11.6)	15.2 (12.9-19.2)	24.1 (19.3-32.2)	33.2 (26.3-42.0)	516
Non-Hispanic whites (2001 - 2002)	2.31 (2.11-2.52)	2.20 (2.01-2.43)	3.80 (3.53-4.39)	7.30 (6.72-7.78)	10.7 (9.62-12.6)	1216
Non-Hispanic whites (2003 - 2004)	3.13 (2.76-3.54)	3.17 (2.76-3.72)	5.28 (4.55-6.21)	8.92 (7.64-10.3)	11.8 (10.2-15.1)	1088
Non-Hispanic whites (2005 - 2006)	4.64 (4.25-5.07)	4.58 (4.35-4.91)	8.28 (7.45-9.01)	13.7 (12.2-15.6)	18.8 (16.9-22.2)	1038
Non-Hispanic whites (2007 - 2008)	6.60 (6.14-7.10)	6.70 (6.26-7.08)	10.9 (10.0-12.1)	17.0 (15.2-20.5)	24.9 (20.5-29.1)	1077
Non-Hispanic whites (2009 - 2010)	7.12 (6.62-7.66)	6.95 (6.51-7.40)	10.7 (10.1-11.8)	17.0 (14.6-20.3)	22.0 (19.1-26.2)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isobutyl phthalate (MiBP) (creatinine corrected) (2011 – 2016)

CAS Number 30833-53-5

Metabolite of Di-isobutyl phthalate (DiBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	6.83 (6.30-7.40)	6.77 (6.19-7.27)	11.6 (10.9-12.6)	19.4 (17.5-22.6)	27.5 (24.5-31.6)	2487
Total population (2013 - 2014)	7.07 (6.67-7.50)	7.00 (6.67-7.37)	11.2 (10.7-11.9)	18.9 (17.1-20.8)	26.2 (23.3-30.0)	2684
Total population (2015 - 2016)	8.71 (8.06-9.42)	8.33 (7.57-8.94)	14.3 (12.9-15.8)	23.1 (21.5-25.0)	32.4 (28.3-38.3)	2974
Age 3-5 years (2015 - 2016)	22.5 (20.3-25.0)	22.4 (20.0-24.2)	34.6 (30.0-38.2)	59.9 (45.0-79.6)	86.1 (60.4-104)	464
Age 6-11 years (2011 - 2012)	11.8 (10.2-13.6)	12.2 (10.4-14.2)	18.5 (16.2-22.4)	31.1 (24.5-46.3)	46.4 (30.8-70.0)	395
Age 6-11 years (2013 - 2014)	11.8 (10.6-13.1)	11.5 (10.8-12.9)	18.9 (16.5-22.7)	33.8 (25.3-44.0)	46.4 (41.1-56.3)	409
Age 6-11 years (2015 - 2016)	14.5 (12.6-16.6)	13.5 (11.9-15.0)	22.2 (18.0-26.8)	42.5 (28.4-49.6)	54.3 (46.3-62.8)	415
Age 12-19 years (2011 - 2012)	7.53 (6.81-8.32)	7.61 (6.84-8.26)	11.7 (10.9-13.8)	19.9 (14.9-24.8)	25.6 (20.6-33.5)	388
Age 12-19 years (2013 - 2014)	7.90 (7.38-8.45)	7.72 (7.18-8.31)	12.3 (10.4-14.9)	21.0 (18.0-26.2)	32.4 (23.1-39.1)	462
Age 12-19 years (2015 - 2016)	8.11 (7.03-9.35)	7.85 (6.77-9.32)	13.0 (10.2-15.9)	19.6 (15.8-23.3)	24.0 (20.6-27.3)	405
Age 20+ years (2011 - 2012)	6.34 (5.83-6.89)	6.19 (5.56-6.85)	10.8 (9.54-11.6)	18.1 (15.5-20.1)	25.2 (23.3-29.9)	1704
Age 20+ years (2013 - 2014)	6.58 (6.15-7.04)	6.54 (6.13-7.00)	10.5 (9.91-11.2)	16.7 (15.4-19.0)	23.9 (19.8-28.2)	1813
Age 20+ years (2015 - 2016)	8.03 (7.41-8.70)	7.60 (6.84-8.62)	13.0 (11.2-14.6)	21.1 (19.2-22.8)	27.5 (23.8-31.0)	1690
Males (2011 - 2012)	6.13 (5.47-6.86)	5.91 (5.12-6.88)	10.7 (8.81-12.2)	17.6 (14.6-22.4)	25.8 (22.2-33.3)	1258
Males (2013 - 2014)	6.23 (5.78-6.72)	6.09 (5.72-6.59)	10.2 (9.38-10.8)	16.6 (14.6-18.4)	23.2 (18.5-28.9)	1284
Males (2015 - 2016)	7.76 (7.03-8.55)	7.27 (6.40-8.43)	12.8 (10.7-14.8)	20.9 (19.4-23.3)	28.4 (25.0-31.0)	1474
Females (2011 - 2012)	7.58 (7.03-8.17)	7.57 (6.94-7.90)	12.8 (11.6-13.8)	21.2 (18.5-24.5)	28.5 (25.2-31.6)	1229
Females (2013 - 2014)	7.98 (7.58-8.41)	8.00 (7.44-8.56)	12.4 (11.5-13.6)	21.1 (19.1-23.9)	29.5 (25.3-33.9)	1400
Females (2015 - 2016)	9.75 (9.06-10.5)	9.25 (8.68-9.95)	15.7 (14.0-17.0)	24.8 (22.4-27.5)	37.7 (28.6-47.9)	1500
Mexican Americans (2011 - 2012)	7.57 (6.49-8.81)	7.00 (5.61-8.77)	12.3 (9.74-15.2)	18.4 (15.2-30.8)	33.1 (18.0-61.6)	316
Mexican Americans (2013 - 2014)	8.96 (7.59-10.6)	8.75 (6.71-10.5)	14.4 (11.8-18.2)	26.7 (20.9-31.5)	34.9 (29.2-45.4)	438
Mexican Americans (2015 - 2016)	10.2 (9.35-11.0)	9.17 (8.63-10.3)	17.3 (15.6-19.1)	28.3 (25.2-33.2)	42.5 (35.4-48.9)	595
Non-Hispanic blacks (2011 - 2012)	7.69 (6.69-8.83)	7.83 (6.73-8.89)	13.2 (10.6-15.4)	20.6 (17.1-26.9)	30.9 (24.5-35.8)	665
Non-Hispanic blacks (2013 - 2014)	7.74 (7.14-8.39)	7.30 (6.79-7.98)	12.7 (11.7-13.8)	21.4 (19.0-24.0)	33.2 (24.2-41.9)	609
Non-Hispanic blacks (2015 - 2016)	9.29 (8.45-10.2)	8.99 (7.84-10.0)	15.6 (13.6-17.2)	25.5 (23.3-28.2)	39.6 (30.3-48.3)	697
Non-Hispanic whites (2011 - 2012)	6.36 (5.68-7.12)	6.12 (5.43-6.93)	11.0 (9.52-11.8)	18.5 (14.8-22.9)	25.8 (21.2-33.8)	811
Non-Hispanic whites (2013 - 2014)	6.44 (5.96-6.96)	6.51 (6.04-6.98)	10.3 (9.23-11.2)	16.7 (15.4-18.0)	22.1 (18.9-25.8)	987
Non-Hispanic whites (2015 - 2016)	8.17 (7.40-9.02)	7.75 (6.92-8.71)	13.6 (11.2-15.3)	21.6 (19.0-23.9)	27.6 (23.8-34.6)	862
All Hispanics (2011 - 2012)	8.09 (6.94-9.43)	8.02 (6.80-9.43)	13.0 (10.6-15.9)	21.0 (15.6-30.5)	30.5 (20.5-45.0)	571
All Hispanics (2013 - 2014)	8.83 (7.82-9.98)	8.53 (7.02-10.0)	14.3 (12.0-16.8)	26.0 (21.2-29.7)	34.8 (29.6-44.5)	690
All Hispanics (2015 - 2016)	9.85 (9.05-10.7)	9.20 (8.61-10.0)	16.5 (14.7-18.1)	27.5 (25.2-32.4)	42.5 (36.3-46.5)	971
Asians (2011 - 2012)	7.64 (6.21-9.39)	7.84 (6.10-9.68)	14.3 (10.5-17.7)	25.0 (18.2-30.6)	33.2 (22.5-55.5)	352
Asians (2013 - 2014)	8.19 (7.41-9.05)	8.04 (6.60-9.52)	13.0 (11.8-15.0)	22.7 (18.5-25.9)	32.8 (24.5-40.0)	288
Asians (2015 - 2016)	9.90 (9.19-10.7)	9.28 (8.20-10.5)	16.6 (13.9-19.0)	26.1 (21.5-35.9)	45.4 (26.2-59.6)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-2-methyl-2-hydroxypropyl phthalate (MHBP) (2013 – 2016)

CAS Number 30833-53-5

Metabolite of Di-isobutyl phthalate (DiBP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	2.50 (2.31-2.72)	2.60 (2.40-2.90)	5.20 (4.80-5.60)	9.40 (8.70-10.1)	13.7 (11.9-15.5)	2681
Total population (2015 - 2016)	2.67 (2.42-2.95)	2.70 (2.50-3.10)	5.50 (4.90-5.90)	10.4 (9.20-11.5)	15.1 (12.8-16.8)	2975
Age 3-5 years (2015 - 2016)	3.76 (3.45-4.09)	3.80 (3.20-4.10)	7.20 (6.30-7.80)	13.6 (10.7-16.5)	20.6 (15.0-23.5)	465
Age 6-11 years (2013 - 2014)	3.95 (3.37-4.63)	4.30 (3.70-4.80)	7.30 (6.50-8.90)	11.8 (10.7-13.6)	15.3 (13.3-20.2)	409
Age 6-11 years (2015 - 2016)	4.04 (3.32-4.92)	4.20 (3.60-4.70)	8.00 (5.70-10.0)	14.5 (10.8-18.3)	21.4 (15.9-25.7)	415
Age 12-19 years (2013 - 2014)	3.64 (3.10-4.29)	3.70 (3.10-4.30)	7.20 (5.90-8.70)	15.8 (12.1-19.5)	25.2 (16.9-33.5)	461
Age 12-19 years (2015 - 2016)	3.47 (2.79-4.33)	3.60 (2.80-4.50)	6.50 (5.00-9.00)	11.4 (9.20-15.0)	15.0 (11.3-20.7)	405
Age 20+ years (2013 - 2014)	2.25 (2.07-2.45)	2.40 (2.20-2.60)	4.70 (4.40-5.00)	8.30 (7.50-9.30)	11.8 (10.4-13.6)	1811
Age 20+ years (2015 - 2016)	2.43 (2.19-2.68)	2.50 (2.20-2.80)	5.00 (4.50-5.70)	9.70 (8.60-10.7)	14.3 (11.7-15.9)	1690
Males (2013 - 2014)	2.56 (2.29-2.87)	2.80 (2.40-3.20)	4.90 (4.50-5.50)	8.90 (7.60-10.7)	12.6 (11.0-15.2)	1284
Males (2015 - 2016)	2.61 (2.34-2.91)	2.70 (2.40-3.10)	5.40 (4.70-5.90)	9.80 (8.50-11.1)	14.4 (11.6-16.1)	1474
Females (2013 - 2014)	2.45 (2.21-2.70)	2.50 (2.20-2.80)	5.40 (4.90-6.10)	9.60 (8.60-10.7)	14.4 (12.3-17.1)	1397
Females (2015 - 2016)	2.73 (2.43-3.08)	2.70 (2.50-3.10)	5.70 (5.00-6.50)	11.1 (9.40-12.7)	15.7 (13.8-18.7)	1501
Mexican Americans (2013 - 2014)	2.85 (2.13-3.81)	2.90 (2.00-4.50)	6.20 (4.80-7.60)	11.4 (9.10-13.3)	14.7 (12.7-17.7)	438
Mexican Americans (2015 - 2016)	2.93 (2.62-3.29)	3.20 (2.70-3.60)	5.40 (4.90-6.00)	10.7 (8.70-13.8)	16.1 (12.9-19.1)	595
Non-Hispanic blacks (2013 - 2014)	3.61 (3.17-4.11)	3.70 (3.30-4.20)	7.10 (6.40-7.70)	14.6 (11.7-17.9)	20.6 (17.6-24.7)	608
Non-Hispanic blacks (2015 - 2016)	3.46 (3.03-3.95)	3.70 (3.30-4.20)	7.00 (6.10-8.00)	11.6 (9.80-14.2)	16.1 (14.2-18.8)	698
Non-Hispanic whites (2013 - 2014)	2.26 (2.05-2.49)	2.40 (2.20-2.70)	4.70 (4.40-5.00)	8.30 (7.30-9.50)	11.4 (9.60-13.2)	986
Non-Hispanic whites (2015 - 2016)	2.48 (2.22-2.77)	2.50 (2.20-2.90)	5.10 (4.50-5.90)	9.90 (8.40-11.3)	15.0 (11.6-15.7)	862
All Hispanics (2013 - 2014)	2.89 (2.39-3.49)	3.10 (2.40-3.80)	6.00 (4.90-7.60)	11.3 (9.40-14.3)	15.7 (13.6-18.9)	690
All Hispanics (2015 - 2016)	2.96 (2.67-3.28)	3.10 (2.70-3.50)	5.50 (5.20-6.20)	11.4 (9.50-13.2)	18.0 (14.0-22.4)	971
Asians (2013 - 2014)	2.07 (1.74-2.45)	2.10 (1.60-2.70)	4.30 (3.60-5.50)	7.30 (5.80-9.50)	9.70 (7.50-15.6)	287
Asians (2015 - 2016)	2.48 (2.07-2.98)	2.40 (1.90-3.10)	5.20 (4.00-6.50)	10.5 (7.80-15.4)	18.7 (10.6-21.2)	301

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.4 and 0.4, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-2-methyl-2-hydroxypropyl phthalate (MHBP) (creatinine corrected) (2013 – 2016)

CAS Number 30833-53-5

Metabolite of Di-isobutyl phthalate (DiBP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	2.51 (2.37-2.66)	2.55 (2.33-2.73)	4.05 (3.86-4.33)	7.12 (6.39-7.54)	9.44 (8.79-10.7)	2680
Total population (2015 - 2016)	2.76 (2.57-2.97)	2.73 (2.50-2.98)	4.62 (4.37-4.92)	7.82 (7.21-8.66)	11.1 (9.80-13.1)	2974
Age 3-5 years (2015 - 2016)	8.97 (8.00-10.1)	8.64 (7.64-9.52)	14.4 (12.4-15.6)	25.2 (19.2-29.0)	32.1 (25.6-48.4)	464
Age 6-11 years (2013 - 2014)	4.99 (4.44-5.61)	4.74 (3.94-5.97)	8.56 (7.24-10.0)	13.8 (11.9-15.3)	16.5 (15.0-25.3)	409
Age 6-11 years (2015 - 2016)	5.21 (4.47-6.06)	4.84 (4.32-5.82)	8.07 (6.92-9.67)	13.9 (10.2-18.5)	20.3 (13.1-30.3)	415
Age 12-19 years (2013 - 2014)	2.96 (2.70-3.24)	2.84 (2.60-3.10)	4.70 (3.89-5.52)	8.42 (7.54-10.0)	12.1 (9.36-15.3)	461
Age 12-19 years (2015 - 2016)	2.70 (2.35-3.10)	2.79 (2.41-3.08)	4.48 (3.57-5.46)	6.60 (5.46-8.32)	8.32 (6.57-9.93)	405
Age 20+ years (2013 - 2014)	2.27 (2.12-2.44)	2.34 (2.12-2.57)	3.67 (3.44-3.89)	5.78 (5.38-6.36)	7.59 (7.19-8.55)	1810
Age 20+ years (2015 - 2016)	2.47 (2.29-2.67)	2.46 (2.21-2.73)	4.08 (3.82-4.44)	6.47 (5.79-7.69)	9.19 (8.28-10.2)	1690
Males (2013 - 2014)	2.16 (1.99-2.33)	2.15 (1.92-2.40)	3.51 (3.26-3.74)	6.19 (5.42-6.83)	8.56 (7.49-10.2)	1283
Males (2015 - 2016)	2.33 (2.15-2.51)	2.15 (1.94-2.50)	3.97 (3.53-4.42)	6.96 (6.07-7.78)	9.51 (8.89-10.2)	1474
Females (2013 - 2014)	2.90 (2.71-3.11)	2.86 (2.64-3.09)	4.69 (4.27-5.05)	7.64 (7.07-8.48)	10.4 (8.99-12.5)	1397
Females (2015 - 2016)	3.27 (3.01-3.54)	3.20 (3.02-3.39)	5.00 (4.63-5.83)	8.76 (7.48-9.80)	13.1 (9.93-17.6)	1500
Mexican Americans (2013 - 2014)	2.90 (2.35-3.58)	2.95 (2.30-3.53)	5.46 (4.12-6.39)	8.79 (7.19-11.6)	12.5 (9.66-16.5)	438
Mexican Americans (2015 - 2016)	3.19 (2.97-3.43)	2.98 (2.79-3.24)	5.35 (4.83-5.75)	9.26 (8.28-10.4)	14.0 (11.4-16.3)	595
Non-Hispanic blacks (2013 - 2014)	2.67 (2.40-2.97)	2.70 (2.33-2.96)	4.39 (3.69-5.00)	7.16 (6.30-8.42)	11.2 (8.42-14.4)	608
Non-Hispanic blacks (2015 - 2016)	2.76 (2.50-3.04)	2.74 (2.34-3.05)	4.78 (4.35-5.12)	8.28 (6.72-9.64)	11.8 (9.64-14.0)	697
Non-Hispanic whites (2013 - 2014)	2.38 (2.16-2.62)	2.43 (2.14-2.75)	3.81 (3.38-4.14)	6.27 (5.19-7.49)	8.55 (7.57-9.38)	986
Non-Hispanic whites (2015 - 2016)	2.66 (2.45-2.90)	2.65 (2.34-2.89)	4.46 (4.05-4.81)	7.48 (6.25-8.89)	9.93 (8.47-13.9)	862
All Hispanics (2013 - 2014)	2.87 (2.47-3.33)	2.88 (2.46-3.29)	5.38 (4.25-5.96)	8.75 (7.18-11.0)	13.0 (10.9-16.5)	690
All Hispanics (2015 - 2016)	3.12 (2.91-3.34)	2.97 (2.78-3.17)	5.23 (4.82-5.67)	9.26 (8.35-10.2)	14.2 (11.4-16.2)	971
Asians (2013 - 2014)	2.64 (2.38-2.94)	2.64 (2.22-2.87)	4.65 (4.09-5.50)	7.73 (6.36-9.60)	9.94 (8.63-12.3)	286
Asians (2015 - 2016)	3.07 (2.76-3.42)	2.88 (2.31-3.46)	5.20 (4.16-6.00)	7.96 (7.14-9.95)	14.9 (8.83-18.9)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-cyclohexyl phthalate (MCHP) (1999 – 2010)‡

CAS Number 7517-36-4

Metabolite of Dicyclohexyl phthalate (DCHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	2.21 (<LOD-3.42)	2541
Total population (2001 - 2002)	*	< LOD	< LOD	.804 (.603-1.01)	1.01 (.804-1.21)	2782
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.603 (.402-.804)	2605
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2548
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2604
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2749
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	2.01 (<LOD-2.21)	3.42 (2.01-7.64)	328
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	.804 (.603-1.01)	1.21 (1.01-1.41)	393
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	.603 (<LOD-.804)	1.01 (.603-1.01)	342
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	389
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	.960 (.640-1.57)	415
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	2.01 (<LOD-3.02)	3.42 (2.01-5.03)	752
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	.804 (.603-1.01)	1.01 (.804-1.21)	742
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	.402 (<LOD-.603)	.804 (.603-1.21)	729
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	401
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	420
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1461
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	.804 (<LOD-1.01)	1.01 (.804-1.21)	1647
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	.603 (.402-.603)	1534
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1914
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	2.21 (<LOD-4.02)	1215
Males (2001 - 2002)	*	< LOD	< LOD	.804 (.603-1.01)	1.01 (.804-1.21)	1371
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	.603 (.603-.804)	1250
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1270
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1399
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	2.21 (<LOD-3.82)	1326
Females (2001 - 2002)	*	< LOD	< LOD	.804 (<LOD-.804)	1.01 (.804-1.01)	1411
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	.603 (.402-1.01)	1355
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1278
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1310
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.81, 0.603, 0.402, 0.603, 0.603 and 0.402 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 2.01 for survey periods 1999-2008 compared with results previously released.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DCHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-cyclohexyl phthalate (MCHP) (1999 – 2010)‡

CAS Number 7517-36-4

Metabolite of Dicyclohexyl phthalate (DCHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	814
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	.804 (<LOD-1.01)	1.01 (.603-1.41)	677
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	.603 (.402-1.01)	652
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	.440 (<LOD-.640)	566
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	2.21 (1.81-2.41)	603
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	.804 (.603-1.01)	1.01 (.804-1.41)	703
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	.603 (.402-.603)	.804 (.603-1.01)	699
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	.480 (<LOD-.620)	516
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	2.01 (<LOD-3.42)	912
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	.804 (<LOD-.804)	1.01 (.804-1.21)	1216
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.603 (.402-.804)	1088
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.81, 0.603, 0.402, 0.603, 0.603 and 0.402 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 2.01 for survey periods 1999-2008 compared with results previously released.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DCHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-cyclohexyl phthalate (MCHP) (creatinine corrected) (1999 – 2010)‡

CAS Number 7517-36-4

Metabolite of Dicyclohexyl phthalate (DCHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	6.03 (<LOD-6.69)	2541
Total population (2001 - 2002)	*	< LOD	< LOD	1.23 (1.07-1.39)	1.83 (1.55-2.01)	2782
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	.905 (.804-1.01)	2605
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2548
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2604
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2749
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	3.10 (<LOD-4.70)	5.67 (3.10-12.9)	328
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	1.39 (1.03-1.49)	1.89 (1.39-2.35)	393
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	.744 (<LOD-1.07)	1.07 (.704-1.67)	342
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	389
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	1.80 (1.34-2.55)	415
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	2.45 (<LOD-3.10)	3.36 (2.73-3.66)	752
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	.945 (.764-1.33)	1.55 (1.07-2.37)	742
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	.442 (<LOD-.543)	.764 (.482-1.25)	729
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	401
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	420
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	1461
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	1.27 (<LOD-1.39)	1.83 (1.55-2.11)	1647
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	.905 (.804-1.01)	1534
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1914
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	4.30 (<LOD-6.35)	1215
Males (2001 - 2002)	*	< LOD	< LOD	1.03 (.844-1.33)	1.77 (1.35-2.13)	1371
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	.663 (.583-1.01)	1250
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1270
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1399
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	6.69 (<LOD-7.10)	1326
Females (2001 - 2002)	*	< LOD	< LOD	1.35 (<LOD-1.55)	1.83 (1.61-2.21)	1411
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	1.01 (.844-1.19)	1355
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1278
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1310
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1350

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 2.01 for survey periods 1999-2008 compared with results previously released.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DCHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-cyclohexyl phthalate (MCHP) (creatinine corrected) (1999 – 2010)‡

CAS Number 7517-36-4

Metabolite of Dicyclohexyl phthalate (DCHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	< LOD	814
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	1.19 (<LOD-1.39)	1.91 (1.59-2.23)	677
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	.784 (.623-1.13)	652
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	1.20 (<LOD-1.56)	566
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	< LOD	2.87 (2.25-3.50)	603
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	.824 (.724-.985)	1.19 (1.01-1.43)	703
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	.503 (.342-.623)	.663 (.523-.945)	699
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	.880 (<LOD-1.08)	516
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	6.35 (<LOD-7.10)	912
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	1.27 (<LOD-1.49)	1.83 (1.55-2.13)	1216
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	.965 (.844-1.07)	1088
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 2.01 for survey periods 1999-2008 compared with results previously released.

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DCHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-ethyl phthalate (MEP) (1999 – 2010)

CAS Number 863029-89-4

Metabolite of Diethyl phthalate (DEP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	118 (103-135)	108 (90.0-132)	300 (244-355)	830 (664-977)	1870 (1420-2490)	2536
Total population (2001 - 2002)	117 (105-131)	112 (93.0-128)	307 (274-348)	813 (688-947)	1650 (1230-2130)	2782
Total population (2003 - 2004)	127 (112-145)	115 (99.9-137)	332 (302-366)	909 (769-1150)	1780 (1420-2180)	2605
Total population (2005 - 2006)	108 (95.5-123)	102 (83.4-121)	284 (257-323)	750 (707-825)	1410 (1140-1830)	2548
Total population (2007 - 2008)	90.4 (80.3-102)	81.1 (70.8-93.5)	239 (205-272)	605 (493-713)	1180 (821-1760)	2604
Total population (2009 - 2010)	64.4 (58.3-71.2)	54.9 (50.5-62.7)	163 (145-187)	485 (374-604)	988 (805-1180)	2749
Age 6-11 years (1999 - 2000)	60.3 (49.4-73.6)	49.8 (41.0-61.8)	130 (85.2-164)	249 (192-481)	499 (250-703)	328
Age 6-11 years (2001 - 2002)	56.2 (47.0-67.2)	47.5 (40.9-61.1)	121 (93.7-143)	297 (208-420)	533 (377-717)	393
Age 6-11 years (2003 - 2004)	62.9 (54.3-72.9)	53.9 (46.4-67.9)	130 (112-159)	344 (195-377)	546 (358-949)	342
Age 6-11 years (2005 - 2006)	55.7 (45.7-67.9)	47.9 (38.3-61.6)	111 (73.9-147)	289 (173-368)	522 (326-719)	356
Age 6-11 years (2007 - 2008)	49.0 (42.4-56.6)	45.2 (38.5-53.3)	108 (80.5-135)	193 (155-227)	296 (214-359)	389
Age 6-11 years (2009 - 2010)	35.2 (31.2-39.8)	33.0 (29.8-37.8)	68.7 (54.3-80.9)	151 (114-207)	288 (205-530)	415
Age 12-19 years (1999 - 2000)	139 (105-183)	127 (92.8-169)	372 (276-540)	994 (694-1420)	2150 (1020-2920)	752
Age 12-19 years (2001 - 2002)	130 (105-161)	121 (97.9-150)	316 (256-429)	835 (649-974)	1360 (969-2020)	742
Age 12-19 years (2003 - 2004)	148 (123-178)	146 (109-194)	367 (285-459)	828 (642-1030)	1520 (900-2180)	729
Age 12-19 years (2005 - 2006)	126 (108-146)	114 (96.4-134)	315 (256-390)	765 (636-1060)	1360 (1030-1680)	702
Age 12-19 years (2007 - 2008)	98.6 (79.1-123)	97.4 (68.3-130)	214 (173-330)	477 (356-705)	821 (511-1270)	401
Age 12-19 years (2009 - 2010)	64.0 (50.1-81.8)	53.9 (39.0-75.4)	151 (101-228)	354 (260-497)	662 (371-1190)	420
Age 20+ years (1999 - 2000)	125 (108-145)	119 (92.6-146)	318 (257-389)	882 (666-1100)	2300 (1470-3060)	1456
Age 20+ years (2001 - 2002)	126 (113-141)	120 (101-140)	329 (291-374)	888 (702-1100)	1800 (1420-2420)	1647
Age 20+ years (2003 - 2004)	135 (116-157)	124 (104-145)	351 (311-415)	1050 (807-1370)	1970 (1480-2510)	1534
Age 20+ years (2005 - 2006)	114 (99.0-132)	111 (87.1-131)	299 (268-346)	782 (724-901)	1480 (1140-2080)	1490
Age 20+ years (2007 - 2008)	95.3 (85.4-106)	84.7 (75.6-97.8)	264 (235-299)	673 (539-823)	1470 (913-1920)	1814
Age 20+ years (2009 - 2010)	69.0 (61.8-76.9)	60.5 (54.0-68.7)	183 (159-207)	557 (445-712)	1110 (875-1350)	1914
Males (1999 - 2000)	118 (98.5-142)	102 (78.3-130)	345 (246-429)	948 (672-1500)	2310 (1400-3010)	1214
Males (2001 - 2002)	120 (103-139)	113 (91.8-131)	331 (276-398)	957 (703-1390)	2040 (1390-2900)	1371
Males (2003 - 2004)	130 (114-148)	113 (97.8-133)	354 (296-432)	1000 (801-1370)	1920 (1460-2300)	1250
Males (2005 - 2006)	107 (92.1-124)	95.9 (75.8-120)	279 (227-340)	757 (651-855)	1470 (923-1930)	1270
Males (2007 - 2008)	92.8 (80.1-107)	81.0 (70.4-93.3)	245 (194-298)	659 (481-867)	1450 (851-1900)	1294
Males (2009 - 2010)	61.0 (54.2-68.6)	52.8 (45.4-58.3)	157 (126-202)	436 (342-586)	965 (768-1170)	1399
Females (1999 - 2000)	118 (102-136)	115 (91.3-139)	280 (231-335)	652 (581-813)	1470 (903-2560)	1322
Females (2001 - 2002)	115 (101-131)	110 (91.5-128)	282 (255-329)	692 (580-867)	1230 (982-1650)	1411
Females (2003 - 2004)	125 (106-148)	120 (90.9-145)	316 (258-372)	830 (639-1080)	1710 (1190-2260)	1355
Females (2005 - 2006)	110 (92.8-130)	109 (86.8-130)	291 (252-346)	734 (671-871)	1310 (1140-1900)	1278
Females (2007 - 2008)	88.2 (77.8-99.9)	82.4 (67.6-101)	233 (202-264)	553 (462-703)	1050 (713-1680)	1310
Females (2009 - 2010)	67.8 (60.3-76.4)	59.6 (52.4-73.7)	164 (148-192)	548 (392-675)	988 (777-1340)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.792, 0.594, 0.264, 0.528, 0.462, and 0.396 respectively.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.66 for survey periods 1999-2008 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-ethyl phthalate (MEP) (1999 – 2010)

CAS Number 863029-89-4

Metabolite of Diethyl phthalate (DEP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	119 (103-138)	115 (96.5-138)	291 (257-357)	842 (561-996)	1130 (966-1410)	813
Mexican Americans (2001 - 2002)	149 (129-173)	145 (125-174)	349 (293-435)	984 (690-1390)	1730 (1010-2940)	677
Mexican Americans (2003 - 2004)	176 (158-196)	164 (140-202)	394 (345-454)	1080 (873-1440)	2010 (1470-2840)	652
Mexican Americans (2005 - 2006)	163 (130-203)	161 (124-186)	384 (310-466)	1030 (682-1830)	1930 (1170-3330)	637
Mexican Americans (2007 - 2008)	122 (105-141)	111 (82.0-144)	314 (270-372)	850 (604-971)	1180 (971-1520)	531
Mexican Americans (2009 - 2010)	82.2 (70.0-96.5)	72.6 (59.6-84.0)	199 (142-254)	586 (415-869)	1300 (818-1760)	566
Non-Hispanic blacks (1999 - 2000)	213 (182-249)	202 (169-231)	521 (419-626)	1250 (932-1500)	2380 (1410-3060)	603
Non-Hispanic blacks (2001 - 2002)	233 (214-253)	235 (191-269)	563 (468-718)	1430 (1070-1630)	2340 (1860-3350)	703
Non-Hispanic blacks (2003 - 2004)	236 (205-272)	202 (167-273)	626 (507-760)	1650 (1220-1970)	2880 (1840-3900)	699
Non-Hispanic blacks (2005 - 2006)	219 (189-254)	199 (163-253)	522 (440-700)	1450 (1070-1900)	2610 (1900-3600)	678
Non-Hispanic blacks (2007 - 2008)	168 (145-195)	165 (132-202)	415 (343-493)	994 (711-1260)	1920 (1090-3370)	597
Non-Hispanic blacks (2009 - 2010)	156 (130-188)	137 (113-159)	405 (276-543)	1190 (841-1570)	1930 (1430-3380)	516
Non-Hispanic whites (1999 - 2000)	101 (87.6-116)	88.4 (71.0-104)	242 (189-318)	651 (527-882)	1630 (1050-2560)	908
Non-Hispanic whites (2001 - 2002)	104 (92.8-117)	96.8 (78.8-117)	273 (241-297)	672 (598-813)	1530 (1030-1800)	1216
Non-Hispanic whites (2003 - 2004)	110 (95.4-128)	97.8 (82.4-115)	276 (242-315)	801 (630-975)	1480 (1050-2170)	1088
Non-Hispanic whites (2005 - 2006)	91.3 (80.3-104)	84.2 (69.4-111)	232 (196-278)	600 (500-715)	1140 (757-1550)	1038
Non-Hispanic whites (2007 - 2008)	78.9 (70.4-88.5)	68.9 (59.8-80.1)	199 (175-233)	506 (429-650)	880 (670-1500)	1077
Non-Hispanic whites (2009 - 2010)	52.1 (48.1-56.5)	45.1 (40.0-51.6)	127 (106-140)	309 (259-394)	768 (468-988)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.792, 0.594, 0.264, 0.528, 0.462, and 0.396 respectively.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.66 for survey periods 1999-2008 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-ethyl phthalate (MEP) (2011 – 2016)

CAS Number 863029-89-4

Metabolite of Diethyl phthalate (DEP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	37.9 (33.0-43.5)	31.1 (27.3-37.9)	96.4 (83.7-114)	277 (227-367)	570 (419-738)	2489
Total population (2013 - 2014)	35.7 (32.1-39.8)	29.9 (27.4-33.1)	82.4 (68.5-98.1)	253 (211-329)	560 (420-684)	2685
Total population (2015 - 2016)	33.6 (29.3-38.4)	28.6 (24.7-33.7)	80.4 (66.9-102)	217 (181-259)	433 (340-531)	2975
Age 3-5 years (2015 - 2016)	19.4 (17.1-22.1)	17.6 (14.8-20.5)	36.4 (30.7-44.9)	86.4 (71.0-106)	140 (109-273)	465
Age 6-11 years (2011 - 2012)	23.4 (18.7-29.2)	24.5 (18.9-28.7)	49.8 (38.4-70.6)	112 (85.0-165)	199 (139-277)	396
Age 6-11 years (2013 - 2014)	24.5 (20.6-29.2)	22.0 (18.4-27.9)	50.0 (36.5-66.2)	133 (88.8-241)	249 (131-390)	409
Age 6-11 years (2015 - 2016)	24.5 (18.6-32.3)	22.1 (16.3-31.1)	49.8 (31.9-75.7)	115 (70.4-203)	211 (143-352)	415
Age 12-19 years (2011 - 2012)	36.2 (27.9-47.0)	30.6 (24.0-40.4)	86.7 (59.0-129)	216 (155-256)	378 (254-642)	388
Age 12-19 years (2013 - 2014)	33.2 (29.3-37.8)	29.8 (24.9-35.6)	77.7 (56.3-96.4)	171 (132-218)	340 (226-459)	462
Age 12-19 years (2015 - 2016)	35.1 (27.8-44.2)	34.1 (25.4-43.7)	79.1 (58.7-106)	191 (113-414)	427 (191-612)	405
Age 20+ years (2011 - 2012)	40.2 (34.9-46.5)	32.0 (27.6-40.9)	105 (93.7-119)	315 (253-406)	688 (460-801)	1705
Age 20+ years (2013 - 2014)	37.6 (33.3-42.6)	31.5 (28.4-35.0)	87.7 (71.1-110)	296 (228-368)	632 (455-821)	1814
Age 20+ years (2015 - 2016)	35.2 (30.9-40.2)	29.0 (25.1-35.9)	90.8 (70.8-113)	235 (192-312)	448 (353-563)	1690
Males (2011 - 2012)	38.1 (33.3-43.7)	29.6 (26.1-35.9)	93.8 (75.3-118)	262 (227-369)	566 (371-875)	1259
Males (2013 - 2014)	36.1 (32.0-40.8)	28.8 (25.1-33.7)	82.4 (61.3-104)	299 (203-387)	588 (405-897)	1285
Males (2015 - 2016)	30.8 (27.2-34.8)	26.6 (21.8-29.9)	68.9 (54.5-87.6)	183 (148-247)	374 (258-480)	1474
Females (2011 - 2012)	37.7 (30.6-46.4)	32.5 (25.2-45.3)	101 (82.8-118)	295 (207-406)	596 (447-727)	1230
Females (2013 - 2014)	35.4 (29.9-41.8)	31.2 (26.2-38.2)	82.2 (68.0-103)	231 (193-308)	485 (374-632)	1400
Females (2015 - 2016)	36.5 (30.2-44.0)	31.6 (25.6-41.1)	96.6 (68.7-125)	243 (192-343)	457 (352-551)	1501
Mexican Americans (2011 - 2012)	49.5 (39.3-62.3)	39.3 (34.0-47.0)	120 (69.8-163)	375 (259-561)	874 (394-1420)	316
Mexican Americans (2013 - 2014)	44.7 (38.5-51.9)	37.0 (28.8-47.6)	106 (85.8-134)	316 (196-435)	568 (353-897)	438
Mexican Americans (2015 - 2016)	35.8 (30.1-42.5)	29.1 (25.8-32.6)	73.7 (54.9-105)	282 (170-437)	652 (364-1080)	595
Non-Hispanic blacks (2011 - 2012)	89.2 (77.9-102)	82.1 (71.0-93.2)	196 (166-229)	524 (381-669)	942 (653-1790)	665
Non-Hispanic blacks (2013 - 2014)	74.3 (67.9-81.3)	63.3 (52.4-75.3)	175 (156-218)	513 (381-616)	1160 (875-1710)	609
Non-Hispanic blacks (2015 - 2016)	68.9 (55.8-85.1)	65.6 (47.8-80.4)	172 (127-237)	436 (312-566)	717 (519-2030)	698
Non-Hispanic whites (2011 - 2012)	30.4 (26.0-35.6)	25.4 (20.1-29.2)	77.6 (64.2-92.9)	221 (166-290)	460 (290-697)	813
Non-Hispanic whites (2013 - 2014)	28.5 (26.1-31.3)	24.5 (21.4-27.4)	58.1 (49.5-67.3)	191 (130-241)	377 (277-632)	987
Non-Hispanic whites (2015 - 2016)	28.7 (25.1-32.9)	24.3 (20.3-28.5)	66.1 (51.6-84.6)	175 (126-217)	339 (200-457)	862
All Hispanics (2011 - 2012)	55.5 (44.2-69.6)	47.6 (38.0-59.6)	132 (99.9-180)	406 (334-537)	809 (461-1240)	571
All Hispanics (2013 - 2014)	49.4 (42.6-57.4)	42.2 (37.0-50.9)	113 (96.4-140)	376 (237-501)	681 (454-1020)	690
All Hispanics (2015 - 2016)	38.6 (33.4-44.6)	31.7 (29.0-35.6)	86.4 (68.9-106)	257 (211-374)	612 (429-786)	971
Asians (2011 - 2012)	23.3 (17.9-30.3)	18.8 (13.9-28.3)	60.7 (38.6-89.5)	166 (109-289)	405 (175-1080)	352
Asians (2013 - 2014)	23.7 (20.7-27.1)	19.3 (15.4-24.0)	54.6 (42.8-72.0)	166 (103-293)	316 (187-433)	289
Asians (2015 - 2016)	24.4 (15.9-37.5)	22.9 (15.7-31.3)	62.0 (42.2-95.4)	163 (90.0-316)	335 (163-761)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.6, 1.2, and 1.2, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-ethyl phthalate (MEP) (creatinine corrected) (1999 – 2010)

CAS Number 863029-89-4

Metabolite of Diethyl phthalate (DEP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	107 (98.0-118)	93.0 (85.4-104)	237 (203-278)	598 (497-781)	1290 (1100-1530)	2536
Total population (2001 - 2002)	110 (99.3-122)	97.4 (87.9-107)	256 (218-287)	640 (532-778)	1220 (959-1450)	2782
Total population (2003 - 2004)	120 (107-133)	101 (90.1-117)	298 (254-332)	733 (587-853)	1350 (1080-1680)	2605
Total population (2005 - 2006)	106 (95.3-117)	92.3 (80.9-104)	242 (211-286)	625 (528-711)	1140 (942-1310)	2548
Total population (2007 - 2008)	91.1 (82.6-101)	75.3 (68.6-83.5)	204 (185-231)	547 (433-680)	987 (821-1190)	2604
Total population (2009 - 2010)	67.2 (60.5-74.7)	56.1 (48.9-66.8)	150 (128-172)	433 (373-524)	850 (709-999)	2749
Age 6-11 years (1999 - 2000)	61.1 (51.4-72.7)	52.5 (43.3-72.4)	109 (83.6-137)	225 (145-365)	412 (264-517)	328
Age 6-11 years (2001 - 2002)	64.0 (54.4-75.2)	53.6 (43.7-69.4)	117 (88.8-148)	338 (191-529)	556 (338-874)	393
Age 6-11 years (2003 - 2004)	66.6 (57.5-77.1)	57.4 (43.9-74.7)	119 (95.6-134)	310 (205-394)	474 (310-877)	342
Age 6-11 years (2005 - 2006)	61.3 (49.6-75.8)	50.1 (42.7-61.0)	107 (76.2-145)	279 (167-441)	512 (366-1210)	356
Age 6-11 years (2007 - 2008)	60.4 (53.9-67.7)	52.8 (42.4-64.2)	108 (96.3-134)	205 (166-237)	278 (228-386)	389
Age 6-11 years (2009 - 2010)	45.9 (41.0-51.3)	39.0 (34.7-41.8)	73.0 (63.2-87.2)	168 (125-234)	296 (182-590)	415
Age 12-19 years (1999 - 2000)	93.7 (78.6-112)	80.7 (61.4-103)	240 (181-326)	580 (446-834)	1160 (661-1320)	752
Age 12-19 years (2001 - 2002)	100 (83.0-121)	92.4 (73.1-119)	218 (164-270)	533 (389-729)	878 (573-1220)	742
Age 12-19 years (2003 - 2004)	111 (93.1-132)	99.1 (81.2-121)	240 (193-320)	522 (389-714)	969 (651-1470)	729
Age 12-19 years (2005 - 2006)	93.6 (80.5-109)	85.3 (69.0-104)	201 (174-238)	500 (389-635)	813 (590-1110)	702
Age 12-19 years (2007 - 2008)	76.7 (61.8-95.1)	72.8 (53.3-91.3)	161 (108-218)	334 (213-491)	547 (334-866)	401
Age 12-19 years (2009 - 2010)	51.4 (40.8-64.9)	46.6 (31.2-68.8)	108 (84.2-137)	236 (150-393)	419 (268-524)	420
Age 20+ years (1999 - 2000)	118 (107-131)	102 (89.5-117)	257 (222-298)	669 (530-965)	1430 (1180-2210)	1456
Age 20+ years (2001 - 2002)	119 (108-132)	105 (96.3-120)	277 (240-321)	702 (583-871)	1400 (1010-1840)	1647
Age 20+ years (2003 - 2004)	130 (115-147)	117 (96.8-133)	338 (279-417)	815 (652-1060)	1510 (1170-2110)	1534
Age 20+ years (2005 - 2006)	115 (103-128)	100 (87.6-117)	278 (233-309)	700 (574-803)	1220 (972-1530)	1490
Age 20+ years (2007 - 2008)	97.9 (89.6-107)	78.7 (73.2-87.7)	236 (208-266)	624 (518-759)	1100 (875-1380)	1814
Age 20+ years (2009 - 2010)	73.0 (65.1-81.9)	62.5 (52.4-72.8)	173 (149-195)	523 (407-662)	989 (810-1120)	1914
Males (1999 - 2000)	92.8 (82.0-105)	79.0 (70.8-88.2)	214 (165-274)	661 (457-978)	1290 (965-1920)	1214
Males (2001 - 2002)	97.6 (85.8-111)	83.2 (72.6-96.8)	232 (186-280)	729 (554-974)	1400 (980-2000)	1371
Males (2003 - 2004)	102 (91.9-113)	83.7 (71.0-99.0)	258 (225-307)	704 (562-896)	1320 (1060-1590)	1250
Males (2005 - 2006)	85.7 (75.4-97.4)	73.0 (61.0-90.2)	204 (172-231)	504 (368-673)	898 (607-1240)	1270
Males (2007 - 2008)	78.1 (68.5-89.1)	65.5 (57.0-73.8)	181 (162-216)	490 (390-625)	936 (662-1190)	1294
Males (2009 - 2010)	54.7 (48.3-62.0)	43.3 (38.2-54.2)	125 (97.7-153)	314 (262-436)	792 (570-935)	1399
Females (1999 - 2000)	123 (109-139)	104 (93.7-118)	249 (203-326)	543 (460-770)	1270 (770-2250)	1322
Females (2001 - 2002)	123 (110-139)	113 (97.4-124)	269 (235-312)	568 (470-725)	944 (784-1330)	1411
Females (2003 - 2004)	139 (119-163)	120 (97.8-143)	335 (250-418)	741 (587-923)	1490 (951-2200)	1355
Females (2005 - 2006)	129 (116-144)	106 (97.4-121)	293 (247-333)	759 (629-920)	1370 (1150-1730)	1278
Females (2007 - 2008)	106 (95.5-117)	88.5 (77.6-98.6)	227 (188-278)	610 (491-727)	1040 (759-1520)	1310
Females (2009 - 2010)	81.9 (72.7-92.2)	69.9 (57.2-80.9)	178 (151-214)	523 (407-661)	987 (716-1220)	1350

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.66 for survey periods 1999-2008 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-ethyl phthalate (MEP) (creatinine corrected) (1999 – 2010)

CAS Number 863029-89-4

Metabolite of Diethyl phthalate (DEP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	108 (93.9-125)	102 (89.8-115)	252 (207-312)	538 (444-643)	875 (643-1270)	813
Mexican Americans (2001 - 2002)	141 (120-165)	131 (108-160)	304 (261-378)	714 (568-1090)	1280 (928-1740)	677
Mexican Americans (2003 - 2004)	159 (141-179)	154 (133-178)	352 (275-439)	815 (631-1060)	1500 (1190-2070)	652
Mexican Americans (2005 - 2006)	146 (123-173)	125 (107-157)	324 (235-425)	767 (600-1020)	1410 (926-2510)	637
Mexican Americans (2007 - 2008)	119 (100-140)	105 (81.9-142)	260 (224-306)	616 (502-750)	1230 (628-2160)	531
Mexican Americans (2009 - 2010)	81.6 (70.9-93.8)	64.9 (56.3-72.7)	170 (131-254)	523 (324-792)	945 (685-1510)	566
Non-Hispanic blacks (1999 - 2000)	137 (121-156)	130 (109-151)	292 (257-333)	682 (503-1120)	1270 (810-1710)	603
Non-Hispanic blacks (2001 - 2002)	163 (149-179)	150 (122-178)	367 (316-408)	818 (634-979)	1380 (1020-1850)	703
Non-Hispanic blacks (2003 - 2004)	167 (148-189)	140 (124-162)	409 (314-522)	1010 (793-1300)	1710 (1420-2310)	699
Non-Hispanic blacks (2005 - 2006)	154 (131-181)	134 (113-160)	360 (311-412)	919 (590-1290)	1700 (1070-2030)	678
Non-Hispanic blacks (2007 - 2008)	131 (115-148)	121 (105-132)	280 (224-334)	614 (489-843)	1100 (836-1780)	597
Non-Hispanic blacks (2009 - 2010)	113 (89.0-143)	92.7 (77.5-121)	236 (180-338)	722 (443-1210)	1300 (890-2240)	516
Non-Hispanic whites (1999 - 2000)	98.3 (88.9-109)	84.5 (72.9-93.7)	206 (158-255)	565 (432-916)	1290 (975-1810)	908
Non-Hispanic whites (2001 - 2002)	103 (93.5-114)	89.6 (82.1-98.9)	223 (190-265)	607 (470-765)	1050 (874-1440)	1216
Non-Hispanic whites (2003 - 2004)	109 (95.3-125)	88.9 (79.2-105)	254 (223-320)	652 (548-876)	1270 (922-1830)	1088
Non-Hispanic whites (2005 - 2006)	96.1 (86.5-107)	84.5 (71.2-97.6)	211 (189-242)	532 (450-686)	993 (828-1240)	1038
Non-Hispanic whites (2007 - 2008)	82.4 (74.7-90.9)	66.4 (58.5-73.8)	185 (158-219)	523 (397-640)	871 (708-1040)	1077
Non-Hispanic whites (2009 - 2010)	58.6 (53.2-64.4)	49.1 (41.4-56.8)	125 (110-146)	366 (278-437)	706 (515-965)	1206

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 0.66 for survey periods 1999-2008 compared with results previously released.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-ethyl phthalate (MEP) (creatinine corrected) (2011 – 2016)

CAS Number 863029-89-4

Metabolite of Diethyl phthalate (DEP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	43.2 (38.5-48.5)	34.4 (30.5-39.2)	94.2 (79.5-111)	263 (198-368)	541 (398-777)	2487
Total population (2013 - 2014)	35.8 (32.6-39.4)	27.9 (24.6-31.7)	73.7 (65.2-84.6)	216 (173-260)	460 (351-606)	2684
Total population (2015 - 2016)	34.7 (31.0-39.0)	27.7 (24.8-31.1)	72.6 (61.8-84.7)	209 (149-250)	374 (301-518)	2974
Age 3-5 years (2015 - 2016)	46.3 (41.3-51.9)	40.0 (35.1-46.3)	73.1 (63.9-86.4)	157 (135-209)	343 (209-455)	464
Age 6-11 years (2011 - 2012)	33.4 (26.7-41.6)	29.2 (23.0-36.7)	59.7 (39.8-99.6)	123 (90.0-172)	177 (144-353)	395
Age 6-11 years (2013 - 2014)	31.0 (26.4-36.3)	26.8 (22.7-30.9)	49.7 (37.1-70.7)	117 (72.5-182)	255 (149-475)	409
Age 6-11 years (2015 - 2016)	31.6 (25.6-39.0)	26.5 (21.8-33.6)	52.0 (38.6-72.1)	120 (77.8-205)	219 (127-358)	415
Age 12-19 years (2011 - 2012)	35.3 (30.5-40.9)	29.4 (22.8-37.3)	61.1 (46.7-94.5)	157 (122-223)	262 (163-549)	388
Age 12-19 years (2013 - 2014)	27.0 (24.7-29.5)	22.1 (20.2-25.0)	49.0 (42.4-55.9)	113 (75.9-162)	192 (139-260)	462
Age 12-19 years (2015 - 2016)	27.3 (23.3-31.9)	21.5 (18.3-27.6)	51.5 (40.4-66.0)	122 (74.4-185)	194 (140-311)	405
Age 20+ years (2011 - 2012)	45.8 (40.4-52.0)	35.4 (32.2-42.3)	101 (86.9-124)	328 (235-405)	634 (432-1010)	1704
Age 20+ years (2013 - 2014)	38.0 (34.2-42.2)	29.6 (25.3-35.2)	84.2 (72.4-97.5)	255 (194-318)	528 (385-699)	1813
Age 20+ years (2015 - 2016)	35.9 (32.0-40.4)	28.5 (25.3-31.9)	78.2 (64.6-96.8)	230 (177-280)	393 (310-560)	1690
Males (2011 - 2012)	35.8 (31.7-40.4)	29.3 (25.0-33.6)	77.3 (60.9-92.4)	203 (156-293)	455 (271-703)	1258
Males (2013 - 2014)	30.4 (26.8-34.4)	22.4 (20.4-25.7)	62.9 (48.7-73.3)	192 (140-290)	442 (295-664)	1284
Males (2015 - 2016)	27.4 (24.7-30.5)	22.4 (19.9-24.8)	53.9 (41.8-67.5)	141 (103-198)	258 (224-308)	1474
Females (2011 - 2012)	51.8 (44.5-60.4)	40.7 (34.0-49.9)	111 (89.2-132)	339 (249-415)	646 (436-1020)	1229
Females (2013 - 2014)	42.0 (37.5-47.0)	33.8 (29.4-41.2)	86.5 (77.2-98.0)	230 (182-279)	468 (352-619)	1400
Females (2015 - 2016)	43.6 (36.8-51.7)	35.2 (30.3-41.2)	93.3 (69.7-117)	262 (208-328)	466 (352-660)	1500
Mexican Americans (2011 - 2012)	55.7 (47.0-66.1)	41.6 (34.5-52.5)	122 (85.3-164)	335 (223-549)	736 (398-1080)	316
Mexican Americans (2013 - 2014)	45.5 (39.9-51.9)	35.9 (32.6-43.8)	94.1 (76.1-129)	320 (192-523)	697 (441-880)	438
Mexican Americans (2015 - 2016)	39.0 (33.7-45.0)	28.0 (24.3-33.2)	83.9 (53.7-115)	246 (148-420)	557 (267-971)	595
Non-Hispanic blacks (2011 - 2012)	69.4 (59.9-80.4)	57.7 (49.7-67.4)	141 (124-168)	404 (274-571)	973 (609-1220)	665
Non-Hispanic blacks (2013 - 2014)	54.8 (48.7-61.7)	44.9 (38.6-52.7)	111 (91.7-132)	393 (275-519)	806 (512-1520)	609
Non-Hispanic blacks (2015 - 2016)	54.9 (46.8-64.3)	47.6 (38.6-55.0)	119 (95.8-141)	313 (228-409)	741 (355-1390)	697
Non-Hispanic whites (2011 - 2012)	37.0 (31.9-43.0)	29.1 (25.0-33.0)	80.4 (62.3-98.6)	230 (152-346)	481 (314-704)	811
Non-Hispanic whites (2013 - 2014)	30.0 (27.2-33.2)	23.5 (21.2-26.7)	56.5 (49.7-68.5)	153 (129-200)	344 (228-455)	987
Non-Hispanic whites (2015 - 2016)	30.8 (27.1-35.1)	25.1 (20.9-29.1)	64.2 (48.0-76.7)	176 (102-256)	310 (233-445)	862
All Hispanics (2011 - 2012)	62.1 (52.3-73.8)	51.2 (42.6-57.4)	138 (101-187)	393 (257-484)	739 (398-1400)	571
All Hispanics (2013 - 2014)	49.1 (44.2-54.5)	40.2 (35.6-46.3)	104 (81.7-121)	332 (242-487)	680 (468-914)	690
All Hispanics (2015 - 2016)	40.6 (35.8-46.2)	30.5 (26.9-36.3)	84.4 (67.6-110)	240 (156-370)	504 (349-736)	971
Asians (2011 - 2012)	31.2 (24.6-39.7)	24.7 (18.6-32.4)	71.3 (49.0-101)	186 (94.0-527)	405 (200-886)	352
Asians (2013 - 2014)	30.1 (24.4-37.1)	24.5 (17.6-33.7)	71.8 (48.4-93.5)	162 (132-241)	418 (209-569)	288
Asians (2015 - 2016)	30.2 (21.4-42.7)	24.6 (16.7-39.5)	74.4 (47.2-111)	198 (102-377)	315 (187-554)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-2-ethylhexyl phthalate (MEHP) (1999 – 2010)

CAS Number 4376-20-9

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	3.43 (3.19-3.69)	3.20 (3.00-3.60)	7.60 (6.80-8.40)	14.9 (13.5-17.4)	23.8 (19.2-28.6)	2541
Total population (2001 - 2002)	4.27 (3.80-4.79)	4.20 (3.70-4.90)	9.80 (8.40-11.6)	23.0 (19.1-27.9)	39.2 (31.8-50.0)	2782
Total population (2003 - 2004)	2.34 (2.10-2.62)	1.90 (1.70-2.40)	5.30 (4.50-6.60)	15.1 (11.4-20.6)	31.0 (21.4-42.0)	2605
Total population (2005 - 2006)	3.04 (2.78-3.32)	2.50 (2.10-2.80)	6.30 (5.70-7.10)	17.7 (14.0-22.5)	39.7 (28.6-52.1)	2548
Total population (2007 - 2008)	2.64 (2.29-3.05)	2.20 (1.80-2.50)	5.40 (4.30-6.90)	14.1 (11.2-20.2)	27.6 (19.8-39.8)	2604
Total population (2009 - 2010)	1.59 (1.41-1.79)	1.51 (1.33-1.71)	3.52 (2.99-4.00)	7.54 (5.96-9.54)	14.1 (9.91-21.1)	2749
Age 6-11 years (1999 - 2000)	5.12 (4.42-5.92)	4.90 (3.70-6.40)	11.1 (8.30-13.6)	19.0 (13.8-36.1)	35.3 (15.6-130)	328
Age 6-11 years (2001 - 2002)	4.41 (3.90-5.00)	4.40 (4.10-5.30)	9.30 (7.90-11.7)	19.7 (14.6-25.9)	31.4 (21.8-47.9)	393
Age 6-11 years (2003 - 2004)	2.84 (2.10-3.84)	2.70 (1.80-4.10)	6.40 (4.40-9.60)	13.9 (7.80-27.6)	27.6 (11.3-64.7)	342
Age 6-11 years (2005 - 2006)	3.10 (2.78-3.47)	3.00 (2.60-3.30)	6.20 (5.10-7.10)	14.1 (9.40-19.3)	19.7 (14.7-36.6)	356
Age 6-11 years (2007 - 2008)	2.39 (2.05-2.80)	2.20 (1.70-2.90)	4.50 (3.70-6.20)	8.70 (6.40-13.9)	15.1 (10.6-24.1)	389
Age 6-11 years (2009 - 2010)	1.64 (1.45-1.85)	1.71 (1.26-2.02)	3.50 (3.09-3.94)	5.95 (4.56-7.56)	8.92 (6.94-12.9)	415
Age 12-19 years (1999 - 2000)	3.75 (3.24-4.35)	3.70 (2.90-4.60)	8.10 (6.40-9.40)	15.3 (11.4-20.5)	22.8 (19.1-29.2)	752
Age 12-19 years (2001 - 2002)	4.57 (3.96-5.27)	4.50 (3.70-5.10)	11.0 (9.50-14.4)	23.0 (17.7-32.7)	42.5 (25.9-57.5)	742
Age 12-19 years (2003 - 2004)	2.77 (2.25-3.41)	2.50 (2.00-3.00)	6.40 (4.50-8.60)	18.6 (10.2-35.6)	40.6 (20.7-58.4)	729
Age 12-19 years (2005 - 2006)	3.72 (3.04-4.56)	3.20 (2.40-4.10)	8.80 (6.20-13.3)	22.6 (13.8-43.4)	48.7 (23.1-62.9)	702
Age 12-19 years (2007 - 2008)	2.99 (2.39-3.75)	2.30 (1.80-2.70)	6.00 (4.40-9.90)	21.1 (11.8-32.8)	37.6 (24.8-74.1)	401
Age 12-19 years (2009 - 2010)	1.82 (1.52-2.16)	1.66 (1.42-1.94)	3.98 (3.35-4.73)	9.53 (6.27-14.0)	17.6 (9.54-27.4)	420
Age 20+ years (1999 - 2000)	3.21 (2.94-3.51)	3.00 (2.70-3.40)	7.30 (6.40-8.00)	14.5 (12.1-17.0)	22.7 (17.5-27.0)	1461
Age 20+ years (2001 - 2002)	4.20 (3.63-4.86)	4.10 (3.50-5.00)	9.50 (8.10-11.9)	23.5 (18.0-29.8)	39.5 (30.3-57.1)	1647
Age 20+ years (2003 - 2004)	2.23 (2.03-2.44)	1.70 (1.50-2.00)	5.10 (4.50-6.00)	15.1 (10.9-19.7)	29.5 (20.4-40.0)	1534
Age 20+ years (2005 - 2006)	2.94 (2.68-3.21)	2.30 (1.90-2.70)	6.20 (5.60-6.70)	17.7 (13.6-24.5)	41.5 (28.6-54.1)	1490
Age 20+ years (2007 - 2008)	2.62 (2.27-3.02)	2.10 (1.80-2.50)	5.40 (4.20-7.10)	14.4 (11.2-20.2)	27.3 (19.2-40.6)	1814
Age 20+ years (2009 - 2010)	1.55 (1.36-1.78)	1.44 (1.25-1.68)	3.40 (2.88-4.03)	7.39 (5.94-9.58)	14.6 (9.91-21.1)	1914
Males (1999 - 2000)	3.68 (3.31-4.10)	3.40 (2.90-3.90)	8.00 (7.40-8.80)	16.0 (14.0-19.0)	25.3 (19.5-36.7)	1215
Males (2001 - 2002)	4.31 (3.84-4.83)	4.30 (3.70-5.10)	9.70 (8.30-11.2)	23.0 (16.9-29.8)	37.9 (29.9-48.4)	1371
Males (2003 - 2004)	2.56 (2.26-2.90)	2.20 (1.70-2.60)	6.00 (4.60-7.70)	17.2 (11.3-26.3)	33.3 (24.9-55.5)	1250
Males (2005 - 2006)	3.40 (3.01-3.85)	2.80 (2.40-3.30)	7.00 (5.70-9.00)	22.6 (15.0-35.8)	49.8 (35.2-67.4)	1270
Males (2007 - 2008)	2.77 (2.35-3.27)	2.30 (1.90-2.80)	5.50 (4.20-7.60)	14.4 (11.2-20.5)	28.9 (19.2-40.0)	1294
Males (2009 - 2010)	1.83 (1.63-2.05)	1.77 (1.63-1.91)	3.97 (3.49-4.51)	8.63 (6.94-11.9)	18.0 (12.6-29.0)	1399
Females (1999 - 2000)	3.21 (2.91-3.54)	3.10 (2.80-3.50)	7.10 (5.90-8.50)	13.6 (12.1-17.2)	21.9 (15.6-28.5)	1326
Females (2001 - 2002)	4.23 (3.67-4.86)	4.10 (3.50-5.00)	9.80 (8.40-12.2)	23.0 (19.5-28.4)	43.5 (31.4-53.7)	1411
Females (2003 - 2004)	2.15 (1.92-2.42)	1.80 (1.50-2.10)	4.90 (4.10-5.70)	13.2 (10.0-18.1)	27.8 (17.5-40.7)	1355
Females (2005 - 2006)	2.72 (2.49-2.98)	2.10 (1.90-2.40)	6.00 (5.20-6.80)	13.9 (11.7-17.5)	30.8 (21.9-36.2)	1278
Females (2007 - 2008)	2.52 (2.18-2.92)	2.00 (1.70-2.40)	5.10 (4.20-6.30)	14.1 (9.50-21.4)	26.4 (19.2-42.1)	1310
Females (2009 - 2010)	1.39 (1.21-1.60)	1.30 (1.12-1.53)	3.00 (2.51-3.62)	6.48 (5.45-8.09)	10.3 (8.33-14.9)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.2, 1.0, 0.9, 1.2, 1.1, and 0.5 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-2-ethylhexyl phthalate (MEHP) (1999 – 2010)

CAS Number 4376-20-9

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	3.49 (3.16-3.85)	3.50 (3.10-3.90)	7.00 (5.70-8.60)	13.3 (10.7-18.7)	23.9 (17.4-27.3)	814
Mexican Americans (2001 - 2002)	4.32 (3.75-4.98)	4.70 (3.80-5.70)	10.1 (8.50-11.4)	19.6 (16.6-23.0)	28.5 (24.2-39.9)	677
Mexican Americans (2003 - 2004)	2.35 (1.87-2.96)	2.20 (1.50-3.00)	5.10 (4.30-6.60)	11.2 (7.50-16.5)	18.5 (11.6-38.2)	652
Mexican Americans (2005 - 2006)	2.99 (2.50-3.57)	2.30 (1.70-3.30)	5.70 (4.70-7.60)	18.4 (12.1-30.6)	36.4 (26.2-63.8)	637
Mexican Americans (2007 - 2008)	2.89 (2.38-3.50)	2.60 (2.00-3.10)	5.30 (4.40-8.20)	16.9 (10.3-27.3)	30.2 (22.9-34.3)	531
Mexican Americans (2009 - 2010)	2.08 (1.84-2.36)	2.10 (1.86-2.40)	4.44 (3.73-5.63)	9.67 (6.89-16.0)	17.9 (13.1-24.3)	566
Non-Hispanic blacks (1999 - 2000)	4.82 (3.92-5.93)	5.20 (4.10-5.80)	9.50 (7.60-11.4)	19.5 (12.9-26.5)	29.5 (18.6-60.3)	603
Non-Hispanic blacks (2001 - 2002)	6.60 (5.57-7.82)	6.70 (5.40-8.10)	15.4 (13.0-18.7)	32.9 (26.5-41.4)	52.6 (41.0-84.0)	703
Non-Hispanic blacks (2003 - 2004)	3.61 (3.07-4.23)	3.50 (3.00-4.00)	8.50 (7.10-11.4)	22.9 (16.5-28.6)	35.2 (29.3-49.1)	699
Non-Hispanic blacks (2005 - 2006)	4.09 (3.51-4.75)	3.70 (3.10-4.10)	9.10 (6.90-11.9)	22.5 (17.4-40.7)	59.3 (34.5-86.7)	678
Non-Hispanic blacks (2007 - 2008)	3.30 (2.98-3.64)	3.20 (2.70-3.60)	7.20 (6.30-8.90)	15.3 (13.3-20.2)	25.5 (19.2-38.1)	597
Non-Hispanic blacks (2009 - 2010)	2.08 (1.79-2.41)	2.05 (1.70-2.42)	4.79 (3.80-5.95)	10.1 (7.50-14.4)	16.4 (9.60-38.4)	516
Non-Hispanic whites (1999 - 2000)	3.16 (2.89-3.46)	2.80 (2.50-3.10)	7.40 (6.30-8.40)	14.5 (12.2-17.4)	22.4 (16.9-28.5)	912
Non-Hispanic whites (2001 - 2002)	3.85 (3.37-4.40)	3.70 (3.10-4.40)	8.70 (7.80-9.90)	20.9 (17.3-25.9)	37.9 (29.9-49.5)	1216
Non-Hispanic whites (2003 - 2004)	2.14 (1.92-2.39)	1.70 (1.40-1.90)	4.80 (4.00-5.80)	13.6 (9.50-20.0)	31.0 (18.1-48.9)	1088
Non-Hispanic whites (2005 - 2006)	2.83 (2.59-3.10)	2.20 (1.80-2.60)	5.90 (5.30-6.90)	17.0 (13.3-21.6)	36.3 (26.6-51.0)	1038
Non-Hispanic whites (2007 - 2008)	2.44 (2.07-2.88)	2.00 (1.70-2.30)	4.90 (3.70-6.20)	13.1 (8.70-20.1)	25.0 (15.8-42.1)	1077
Non-Hispanic whites (2009 - 2010)	1.41 (1.22-1.62)	1.30 (1.12-1.57)	3.04 (2.53-3.60)	6.12 (5.23-7.65)	11.8 (7.63-21.1)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.2, 1.0, 0.9, 1.2, 1.1, and 0.5 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-2-ethylhexyl phthalate (MEHP) (2011 – 2016)

CAS Number 4376-20-9

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.36 (1.25-1.49)	1.40 (1.20-1.50)	3.00 (2.70-3.30)	6.00 (5.30-6.40)	8.70 (7.60-9.70)	2489
Total population (2013 - 2014)	*	1.10 (.900-1.20)	2.30 (2.10-2.60)	4.40 (4.00-5.00)	6.30 (5.60-7.10)	2685
Total population (2015 - 2016)	*	1.10 (1.00-1.10)	2.20 (2.00-2.40)	4.00 (3.80-4.20)	6.00 (5.60-7.10)	2975
Age 3-5 years (2015 - 2016)	1.28 (1.16-1.40)	1.10 (1.00-1.40)	2.20 (1.90-2.50)	3.80 (3.20-5.00)	6.00 (5.00-8.00)	465
Age 6-11 years (2011 - 2012)	1.41 (1.23-1.61)	1.50 (1.20-1.80)	2.90 (2.50-3.40)	5.30 (4.10-7.10)	7.60 (6.30-8.80)	396
Age 6-11 years (2013 - 2014)	1.44 (1.24-1.66)	1.20 (1.00-1.50)	2.70 (2.20-3.20)	5.20 (3.70-8.50)	8.70 (5.20-11.8)	409
Age 6-11 years (2015 - 2016)	1.42 (1.28-1.57)	1.30 (1.00-1.60)	2.60 (2.20-3.00)	4.20 (3.60-4.80)	5.90 (4.70-8.10)	415
Age 12-19 years (2011 - 2012)	1.58 (1.33-1.87)	1.50 (1.00-2.30)	3.90 (3.10-4.40)	6.80 (5.20-10.3)	12.5 (8.90-14.3)	388
Age 12-19 years (2013 - 2014)	1.43 (1.26-1.62)	1.20 (1.00-1.40)	2.60 (2.00-3.50)	4.90 (4.20-5.80)	8.30 (5.50-10.7)	462
Age 12-19 years (2015 - 2016)	1.17 (1.07-1.27)	1.00 (.900-1.10)	1.80 (1.50-2.30)	3.50 (3.10-4.40)	5.00 (3.90-7.20)	405
Age 20+ years (2011 - 2012)	1.33 (1.19-1.48)	1.30 (1.10-1.50)	2.90 (2.50-3.20)	5.90 (5.10-6.40)	8.30 (7.10-9.60)	1705
Age 20+ years (2013 - 2014)	*	1.00 (.900-1.20)	2.30 (2.00-2.50)	4.30 (3.80-4.90)	6.10 (5.40-6.80)	1814
Age 20+ years (2015 - 2016)	*	1.00 (.900-1.10)	2.20 (2.00-2.40)	4.00 (3.80-4.40)	6.40 (5.70-8.20)	1690
Males (2011 - 2012)	1.51 (1.33-1.70)	1.50 (1.20-1.80)	3.10 (2.60-3.90)	6.10 (5.50-7.00)	9.20 (7.70-11.3)	1259
Males (2013 - 2014)	1.29 (1.17-1.41)	1.10 (1.00-1.30)	2.30 (2.00-2.70)	4.20 (3.50-5.00)	5.70 (5.10-6.60)	1285
Males (2015 - 2016)	1.33 (1.23-1.43)	1.10 (1.00-1.30)	2.40 (2.20-2.80)	4.10 (3.80-4.80)	6.40 (5.20-8.40)	1474
Females (2011 - 2012)	1.24 (1.14-1.34)	1.20 (1.00-1.40)	2.90 (2.50-3.10)	5.60 (4.90-6.30)	8.10 (6.80-9.20)	1230
Females (2013 - 2014)	*	1.00 (.900-1.10)	2.40 (2.10-2.60)	4.80 (4.20-5.30)	7.00 (5.70-8.70)	1400
Females (2015 - 2016)	*	1.00 (.900-1.10)	1.90 (1.70-2.10)	3.90 (3.40-4.40)	5.80 (5.00-7.60)	1501
Mexican Americans (2011 - 2012)	1.49 (1.16-1.91)	1.50 (1.00-1.90)	3.40 (2.50-4.30)	6.60 (5.10-8.90)	9.60 (6.60-12.9)	316
Mexican Americans (2013 - 2014)	1.55 (1.35-1.78)	1.50 (1.20-1.70)	2.90 (2.20-3.80)	5.60 (4.20-7.00)	7.40 (6.30-9.30)	438
Mexican Americans (2015 - 2016)	1.38 (1.23-1.55)	1.20 (.900-1.50)	2.60 (2.00-3.10)	4.90 (3.70-5.80)	7.60 (5.10-9.70)	595
Non-Hispanic blacks (2011 - 2012)	1.89 (1.67-2.13)	2.00 (1.60-2.40)	4.00 (3.40-4.90)	8.00 (6.20-9.70)	11.3 (9.60-14.9)	665
Non-Hispanic blacks (2013 - 2014)	1.63 (1.39-1.92)	1.50 (1.10-2.00)	3.30 (2.50-4.00)	5.80 (5.10-6.70)	8.10 (6.50-10.5)	609
Non-Hispanic blacks (2015 - 2016)	1.59 (1.44-1.77)	1.50 (1.20-1.80)	2.90 (2.60-3.30)	5.80 (4.80-7.60)	9.30 (6.60-13.9)	698
Non-Hispanic whites (2011 - 2012)	1.21 (1.07-1.37)	1.10 (.900-1.50)	2.70 (2.20-3.10)	4.90 (4.20-6.10)	6.70 (6.00-8.30)	813
Non-Hispanic whites (2013 - 2014)	*	.900 (.800-1.00)	2.00 (1.80-2.30)	3.90 (3.20-4.30)	5.50 (4.80-6.30)	987
Non-Hispanic whites (2015 - 2016)	*	.900 (<LOD-1.10)	1.90 (1.70-2.10)	3.50 (3.00-3.90)	5.00 (4.10-7.10)	862
All Hispanics (2011 - 2012)	1.61 (1.40-1.83)	1.70 (1.30-2.00)	3.90 (3.10-4.70)	7.30 (6.30-8.70)	11.6 (9.20-12.9)	571
All Hispanics (2013 - 2014)	1.55 (1.40-1.73)	1.50 (1.20-1.70)	2.90 (2.50-3.40)	5.20 (4.40-6.30)	7.20 (6.20-9.20)	690
All Hispanics (2015 - 2016)	1.37 (1.25-1.49)	1.20 (1.10-1.40)	2.40 (2.20-2.80)	4.30 (3.80-5.10)	6.20 (5.10-8.10)	971
Asians (2011 - 2012)	1.69 (1.44-1.98)	1.70 (1.30-1.90)	3.60 (2.80-4.40)	7.80 (6.60-11.4)	13.8 (10.0-17.8)	352
Asians (2013 - 2014)	*	1.00 (<LOD-1.20)	2.10 (1.80-2.80)	4.30 (3.50-6.10)	7.90 (4.90-10.5)	289
Asians (2015 - 2016)	1.57 (1.35-1.83)	1.50 (1.10-1.70)	3.20 (2.60-4.00)	6.90 (4.30-8.40)	8.80 (7.60-11.5)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.5, 0.8, and 0.8, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-2-ethylhexyl phthalate (MEHP) (creatinine corrected) (1999 – 2010)

CAS Number 4376-20-9

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	3.12 (2.95-3.31)	3.08 (2.82-3.27)	5.88 (5.38-6.25)	10.8 (9.62-12.5)	18.9 (15.0-21.8)	2541
Total population (2001 - 2002)	4.00 (3.58-4.48)	3.90 (3.44-4.47)	7.94 (7.22-9.02)	18.0 (15.3-21.5)	32.8 (25.2-42.9)	2782
Total population (2003 - 2004)	2.20 (2.01-2.41)	1.89 (1.68-2.19)	4.31 (3.84-4.74)	10.8 (8.72-13.8)	25.4 (16.7-34.7)	2605
Total population (2005 - 2006)	2.96 (2.72-3.23)	2.61 (2.37-2.86)	5.69 (5.00-6.47)	13.7 (11.4-17.8)	30.1 (21.2-35.2)	2548
Total population (2007 - 2008)	2.66 (2.37-2.99)	2.36 (2.11-2.67)	5.15 (4.35-6.00)	11.8 (8.89-15.6)	21.9 (14.6-33.4)	2604
Total population (2009 - 2010)	1.66 (1.45-1.90)	1.52 (1.36-1.77)	3.09 (2.69-3.60)	6.28 (4.98-8.48)	11.2 (8.33-19.1)	2749
Age 6-11 years (1999 - 2000)	5.19 (4.55-5.93)	5.37 (4.52-5.95)	9.11 (8.06-11.4)	21.6 (11.5-41.9)	41.9 (13.5-86.2)	328
Age 6-11 years (2001 - 2002)	5.03 (4.47-5.65)	5.38 (4.51-6.21)	9.90 (7.87-11.5)	21.1 (13.8-28.8)	31.4 (24.3-40.7)	393
Age 6-11 years (2003 - 2004)	3.00 (2.30-3.93)	2.80 (1.93-4.09)	5.86 (4.69-7.70)	14.3 (8.54-24.4)	28.7 (14.1-45.3)	342
Age 6-11 years (2005 - 2006)	3.42 (3.08-3.79)	3.26 (2.63-3.92)	6.18 (5.40-6.85)	11.3 (8.96-17.4)	20.7 (11.3-31.8)	356
Age 6-11 years (2007 - 2008)	2.95 (2.49-3.49)	2.80 (2.17-3.33)	5.42 (3.95-6.51)	10.6 (7.47-14.0)	15.6 (10.6-23.7)	389
Age 6-11 years (2009 - 2010)	2.13 (1.90-2.40)	2.08 (1.88-2.33)	3.69 (3.13-4.20)	5.83 (4.80-7.95)	8.89 (5.88-20.1)	415
Age 12-19 years (1999 - 2000)	2.53 (2.14-2.99)	2.35 (2.05-2.76)	5.83 (4.38-6.29)	9.66 (7.41-11.5)	12.1 (10.5-17.3)	752
Age 12-19 years (2001 - 2002)	3.53 (3.09-4.03)	3.67 (2.89-4.48)	7.47 (6.51-8.67)	15.2 (11.7-21.9)	25.2 (17.7-32.8)	742
Age 12-19 years (2003 - 2004)	2.07 (1.74-2.48)	1.88 (1.60-2.23)	4.25 (3.19-5.62)	11.6 (6.83-23.2)	24.8 (11.6-37.9)	729
Age 12-19 years (2005 - 2006)	2.77 (2.27-3.38)	2.43 (2.03-2.87)	5.24 (4.06-7.75)	15.2 (9.86-23.2)	27.1 (16.0-43.7)	702
Age 12-19 years (2007 - 2008)	2.33 (1.90-2.86)	2.00 (1.67-2.57)	4.33 (3.55-6.23)	12.6 (8.31-16.3)	21.9 (12.0-45.7)	401
Age 12-19 years (2009 - 2010)	1.46 (1.20-1.77)	1.33 (1.09-1.61)	2.85 (2.24-3.63)	7.47 (4.31-11.6)	13.2 (8.11-20.9)	420
Age 20+ years (1999 - 2000)	3.03 (2.83-3.25)	2.98 (2.73-3.23)	5.55 (4.90-6.06)	10.0 (8.60-12.9)	17.5 (13.8-22.1)	1461
Age 20+ years (2001 - 2002)	3.97 (3.49-4.52)	3.82 (3.26-4.38)	7.79 (7.00-9.00)	18.3 (15.3-21.8)	34.5 (23.1-47.9)	1647
Age 20+ years (2003 - 2004)	2.14 (1.98-2.31)	1.84 (1.63-2.08)	4.14 (3.78-4.40)	10.5 (8.38-12.9)	25.6 (15.9-36.3)	1534
Age 20+ years (2005 - 2006)	2.94 (2.69-3.23)	2.60 (2.36-2.83)	5.67 (4.77-6.52)	13.8 (11.3-18.1)	33.1 (21.9-47.4)	1490
Age 20+ years (2007 - 2008)	2.69 (2.39-3.02)	2.36 (2.14-2.66)	5.20 (4.38-6.04)	11.8 (8.94-16.6)	22.1 (13.5-37.1)	1814
Age 20+ years (2009 - 2010)	1.65 (1.43-1.90)	1.51 (1.34-1.75)	3.04 (2.63-3.60)	6.24 (4.98-8.61)	11.1 (8.03-19.4)	1914
Males (1999 - 2000)	2.89 (2.60-3.22)	2.76 (2.52-2.96)	5.58 (4.71-6.08)	10.3 (9.35-12.4)	21.6 (14.1-27.7)	1215
Males (2001 - 2002)	3.50 (3.08-3.99)	3.33 (2.83-3.90)	7.00 (6.49-7.77)	16.2 (12.8-20.9)	31.6 (20.5-49.4)	1371
Males (2003 - 2004)	2.01 (1.82-2.21)	1.71 (1.46-1.89)	4.14 (3.49-4.81)	10.4 (7.68-16.2)	23.3 (15.1-41.1)	1250
Males (2005 - 2006)	2.73 (2.43-3.07)	2.30 (2.12-2.61)	5.08 (4.29-6.14)	14.3 (11.2-20.5)	31.0 (21.5-50.9)	1270
Males (2007 - 2008)	2.33 (2.03-2.68)	2.00 (1.71-2.34)	4.36 (3.71-5.41)	11.6 (8.33-14.2)	20.2 (14.6-26.3)	1294
Males (2009 - 2010)	1.64 (1.45-1.85)	1.52 (1.39-1.74)	3.06 (2.70-3.60)	6.53 (5.18-9.49)	13.0 (8.65-22.2)	1399
Females (1999 - 2000)	3.36 (3.11-3.63)	3.33 (2.91-3.80)	6.15 (5.55-6.77)	11.1 (9.11-14.0)	17.3 (12.4-24.6)	1326
Females (2001 - 2002)	4.54 (4.02-5.13)	4.47 (3.85-5.14)	9.28 (7.94-10.3)	20.3 (16.6-24.4)	34.7 (27.1-42.0)	1411
Females (2003 - 2004)	2.40 (2.15-2.69)	2.16 (1.84-2.40)	4.40 (3.97-4.89)	10.9 (8.27-16.0)	27.0 (17.5-34.6)	1355
Females (2005 - 2006)	3.20 (2.89-3.55)	2.89 (2.58-3.17)	6.07 (5.00-7.00)	13.3 (10.4-16.3)	28.2 (18.2-37.4)	1278
Females (2007 - 2008)	3.02 (2.70-3.38)	2.76 (2.36-3.02)	5.57 (4.90-6.50)	12.1 (8.64-18.2)	24.7 (14.8-44.4)	1310
Females (2009 - 2010)	1.68 (1.44-1.96)	1.53 (1.35-1.89)	3.10 (2.68-3.69)	5.75 (4.58-8.03)	10.5 (7.36-17.5)	1350

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-2-ethylhexyl phthalate (MEHP) (creatinine corrected) (1999 – 2010)

CAS Number 4376-20-9

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	3.16 (2.72-3.68)	3.15 (2.52-3.81)	5.88 (4.86-7.24)	11.6 (9.63-13.1)	15.7 (12.6-23.1)	814
Mexican Americans (2001 - 2002)	4.07 (3.60-4.61)	4.18 (3.82-4.90)	7.80 (6.64-9.49)	16.4 (13.6-18.9)	24.9 (19.8-28.7)	677
Mexican Americans (2003 - 2004)	2.12 (1.74-2.59)	1.94 (1.50-2.42)	4.06 (3.29-4.93)	9.38 (5.72-15.4)	16.8 (9.86-38.6)	652
Mexican Americans (2005 - 2006)	2.69 (2.36-3.07)	2.41 (2.04-2.73)	4.82 (4.09-6.05)	14.3 (10.0-16.9)	27.2 (16.3-40.1)	637
Mexican Americans (2007 - 2008)	2.82 (2.38-3.34)	2.45 (2.08-2.89)	5.00 (4.14-6.86)	12.3 (9.58-20.7)	29.0 (17.0-50.3)	531
Mexican Americans (2009 - 2010)	2.07 (1.83-2.34)	1.89 (1.69-2.31)	4.06 (3.50-4.98)	8.38 (6.08-11.3)	13.9 (9.70-20.0)	566
Non-Hispanic blacks (1999 - 2000)	3.11 (2.59-3.73)	3.13 (2.50-3.61)	5.84 (4.43-7.32)	10.2 (8.05-15.6)	18.4 (11.6-35.2)	603
Non-Hispanic blacks (2001 - 2002)	4.63 (3.96-5.42)	4.59 (3.97-5.02)	9.93 (7.95-12.4)	21.2 (16.0-33.2)	39.9 (27.7-48.1)	703
Non-Hispanic blacks (2003 - 2004)	2.56 (2.24-2.92)	2.28 (2.02-2.78)	5.17 (4.48-6.83)	13.2 (10.5-16.2)	27.5 (18.4-36.0)	699
Non-Hispanic blacks (2005 - 2006)	2.87 (2.45-3.38)	2.41 (2.09-2.78)	5.72 (4.40-7.29)	15.0 (12.0-20.6)	54.4 (18.4-84.0)	678
Non-Hispanic blacks (2007 - 2008)	2.56 (2.26-2.90)	2.40 (2.17-2.73)	4.77 (4.07-5.76)	11.4 (8.75-15.4)	18.0 (16.1-26.3)	597
Non-Hispanic blacks (2009 - 2010)	1.51 (1.22-1.86)	1.48 (1.14-1.93)	2.87 (2.26-3.69)	5.73 (3.69-10.7)	10.7 (5.61-19.1)	516
Non-Hispanic whites (1999 - 2000)	3.09 (2.84-3.36)	3.08 (2.73-3.47)	5.87 (5.11-6.67)	10.6 (8.95-13.5)	20.0 (14.0-24.6)	912
Non-Hispanic whites (2001 - 2002)	3.81 (3.34-4.35)	3.67 (3.11-4.33)	7.78 (6.74-9.35)	17.0 (14.1-21.8)	32.8 (21.5-46.9)	1216
Non-Hispanic whites (2003 - 2004)	2.12 (1.91-2.35)	1.82 (1.60-2.13)	4.11 (3.49-4.42)	10.7 (7.42-15.1)	27.0 (15.1-37.4)	1088
Non-Hispanic whites (2005 - 2006)	2.98 (2.77-3.21)	2.66 (2.43-2.93)	5.73 (5.00-6.47)	13.4 (11.3-17.8)	27.7 (19.5-37.4)	1038
Non-Hispanic whites (2007 - 2008)	2.55 (2.20-2.94)	2.26 (1.97-2.67)	4.90 (3.99-5.92)	11.0 (7.80-14.8)	20.5 (11.9-30.2)	1077
Non-Hispanic whites (2009 - 2010)	1.58 (1.36-1.84)	1.49 (1.27-1.76)	2.94 (2.50-3.49)	5.64 (4.53-7.96)	10.3 (6.85-18.3)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-2-ethylhexyl phthalate (MEHP) (creatinine corrected) (2011 – 2016)

CAS Number 4376-20-9

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.55 (1.43-1.68)	1.46 (1.33-1.67)	2.73 (2.50-2.92)	4.91 (4.55-5.52)	8.47 (6.72-9.86)	2487
Total population (2013 - 2014)	*	1.21 (1.11-1.33)	2.19 (2.05-2.38)	3.82 (3.46-4.15)	5.18 (4.66-5.74)	2684
Total population (2015 - 2016)	*	1.24 (1.13-1.33)	2.19 (2.03-2.39)	4.07 (3.56-4.48)	5.93 (5.43-6.51)	2974
Age 3-5 years (2015 - 2016)	3.05 (2.77-3.36)	2.86 (2.58-3.24)	4.90 (4.23-5.54)	8.49 (7.13-9.64)	11.0 (9.64-13.2)	464
Age 6-11 years (2011 - 2012)	2.02 (1.81-2.25)	2.07 (1.75-2.44)	3.45 (2.82-4.06)	5.26 (4.60-5.89)	7.15 (5.89-8.17)	395
Age 6-11 years (2013 - 2014)	1.81 (1.57-2.09)	1.76 (1.53-2.01)	3.13 (2.59-3.86)	6.33 (4.02-8.32)	8.32 (5.53-14.1)	409
Age 6-11 years (2015 - 2016)	1.83 (1.63-2.04)	1.82 (1.60-2.08)	2.96 (2.56-3.39)	4.67 (4.07-5.23)	6.25 (5.08-8.45)	415
Age 12-19 years (2011 - 2012)	1.53 (1.33-1.78)	1.40 (1.12-1.88)	2.79 (2.20-3.88)	5.00 (4.11-6.94)	9.86 (5.00-11.1)	388
Age 12-19 years (2013 - 2014)	1.16 (1.03-1.31)	1.15 (1.00-1.27)	1.88 (1.67-2.10)	3.35 (2.38-4.07)	4.79 (3.61-6.76)	462
Age 12-19 years (2015 - 2016)	.908 (.814-1.01)	.864 (.731-.991)	1.53 (1.29-1.75)	2.53 (2.28-2.72)	3.41 (2.72-4.56)	405
Age 20+ years (2011 - 2012)	1.51 (1.39-1.64)	1.46 (1.28-1.58)	2.59 (2.38-2.84)	4.81 (4.35-5.51)	8.49 (6.18-11.2)	1704
Age 20+ years (2013 - 2014)	*	1.19 (1.08-1.31)	2.19 (1.98-2.41)	3.70 (3.25-4.09)	5.00 (4.34-5.40)	1813
Age 20+ years (2015 - 2016)	*	1.18 (1.10-1.29)	2.10 (1.90-2.31)	3.88 (3.27-4.50)	5.90 (4.96-6.67)	1690
Males (2011 - 2012)	1.41 (1.28-1.56)	1.36 (1.19-1.58)	2.52 (2.21-2.83)	4.58 (3.77-5.46)	7.19 (6.16-8.79)	1258
Males (2013 - 2014)	1.08 (.984-1.19)	1.03 (.950-1.12)	1.78 (1.58-2.00)	3.17 (2.73-3.60)	4.30 (3.94-5.06)	1284
Males (2015 - 2016)	1.18 (1.08-1.30)	1.14 (1.02-1.29)	2.04 (1.84-2.27)	3.41 (2.85-4.27)	4.83 (4.23-6.25)	1474
Females (2011 - 2012)	1.70 (1.56-1.85)	1.58 (1.43-1.75)	2.86 (2.63-3.18)	5.36 (4.64-5.89)	8.89 (6.67-13.2)	1229
Females (2013 - 2014)	*	1.48 (1.33-1.64)	2.59 (2.36-2.96)	4.29 (3.70-5.00)	5.74 (5.12-7.70)	1400
Females (2015 - 2016)	*	1.32 (1.17-1.46)	2.42 (2.18-2.71)	4.50 (4.05-5.06)	6.84 (5.61-8.00)	1500
Mexican Americans (2011 - 2012)	1.68 (1.36-2.06)	1.67 (1.21-2.06)	2.91 (2.46-3.50)	6.23 (4.32-9.05)	11.3 (5.67-18.3)	316
Mexican Americans (2013 - 2014)	1.58 (1.35-1.85)	1.48 (1.24-1.83)	2.85 (2.46-3.39)	4.62 (4.07-5.56)	7.13 (5.53-8.04)	438
Mexican Americans (2015 - 2016)	1.50 (1.39-1.62)	1.47 (1.34-1.57)	2.64 (2.19-3.00)	4.30 (3.91-4.83)	5.88 (5.14-7.81)	595
Non-Hispanic blacks (2011 - 2012)	1.47 (1.29-1.67)	1.44 (1.26-1.75)	2.75 (2.37-3.14)	5.16 (4.17-7.05)	8.69 (6.07-12.1)	665
Non-Hispanic blacks (2013 - 2014)	1.20 (1.07-1.36)	1.13 (.957-1.39)	2.11 (1.85-2.44)	3.46 (2.96-4.07)	5.05 (3.74-6.31)	609
Non-Hispanic blacks (2015 - 2016)	1.27 (1.13-1.43)	1.19 (1.07-1.37)	2.40 (2.08-2.69)	4.39 (3.75-5.23)	7.08 (5.23-8.22)	697
Non-Hispanic whites (2011 - 2012)	1.47 (1.29-1.68)	1.45 (1.25-1.65)	2.51 (2.17-2.84)	4.43 (3.77-5.00)	6.77 (5.00-9.54)	811
Non-Hispanic whites (2013 - 2014)	*	1.16 (1.02-1.31)	2.11 (1.84-2.33)	3.56 (3.00-4.10)	4.68 (4.19-5.62)	987
Non-Hispanic whites (2015 - 2016)	*	1.14 (<LOD-1.27)	1.97 (1.78-2.19)	3.56 (2.98-4.30)	5.58 (4.39-6.54)	862
All Hispanics (2011 - 2012)	1.80 (1.63-1.98)	1.79 (1.59-2.00)	3.32 (2.86-3.76)	6.37 (5.67-8.07)	11.3 (7.79-14.4)	571
All Hispanics (2013 - 2014)	1.54 (1.38-1.73)	1.43 (1.22-1.67)	2.80 (2.48-3.10)	4.39 (3.98-5.09)	6.61 (5.53-7.64)	690
All Hispanics (2015 - 2016)	1.44 (1.35-1.53)	1.40 (1.27-1.50)	2.48 (2.20-2.71)	4.27 (3.76-4.75)	5.88 (5.18-7.12)	971
Asians (2011 - 2012)	2.26 (1.98-2.58)	1.98 (1.71-2.33)	4.18 (3.26-5.00)	8.89 (6.40-12.6)	14.0 (10.0-20.1)	352
Asians (2013 - 2014)	*	1.43 (<LOD-1.70)	2.76 (2.31-3.13)	5.00 (3.96-5.87)	6.85 (5.17-9.73)	288
Asians (2015 - 2016)	1.94 (1.66-2.27)	1.95 (1.63-2.18)	3.56 (2.74-4.05)	6.57 (5.09-8.18)	11.5 (7.13-14.8)	301

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP) (2001 – 2010)

CAS Number 40321-99-1

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	20.0 (17.8-22.5)	20.1 (17.8-22.4)	43.6 (38.0-49.7)	92.3 (77.0-108)	192 (131-256)	2782
Total population (2003 - 2004)	21.7 (19.3-24.4)	21.2 (18.7-24.1)	49.1 (40.5-56.9)	121 (91.3-164)	266 (165-383)	2605
Total population (2005 - 2006)	25.5 (23.0-28.2)	23.8 (21.5-26.8)	55.1 (50.2-61.0)	153 (132-180)	306 (240-421)	2548
Total population (2007 - 2008)	22.1 (18.7-26.0)	20.7 (17.6-23.7)	48.2 (39.8-61.8)	123 (83.7-181)	238 (171-336)	2604
Total population (2009 - 2010)	12.9 (11.3-14.7)	12.9 (11.4-14.8)	25.8 (22.1-30.3)	53.2 (41.7-75.2)	103 (74.2-149)	2749
Age 6-11 years (2001 - 2002)	33.6 (29.7-37.9)	32.9 (26.9-39.1)	66.9 (49.7-74.0)	127 (103-148)	216 (137-280)	393
Age 6-11 years (2003 - 2004)	36.9 (28.4-47.9)	36.5 (26.5-47.0)	77.4 (49.1-103)	164 (79.9-350)	318 (164-400)	342
Age 6-11 years (2005 - 2006)	34.9 (30.8-39.6)	35.7 (31.3-40.7)	68.9 (56.5-76.0)	140 (101-169)	206 (133-401)	356
Age 6-11 years (2007 - 2008)	28.6 (23.4-34.8)	27.0 (20.1-36.4)	56.1 (45.4-67.8)	113 (76.5-218)	242 (109-351)	389
Age 6-11 years (2009 - 2010)	15.0 (13.2-17.1)	17.0 (14.1-19.8)	28.9 (24.4-37.4)	49.3 (41.2-70.2)	75.1 (55.2-117)	415
Age 12-19 years (2001 - 2002)	24.9 (21.3-29.1)	25.3 (22.9-31.3)	50.6 (40.7-64.5)	107 (78.5-148)	216 (117-330)	742
Age 12-19 years (2003 - 2004)	28.3 (23.0-34.8)	29.8 (25.9-33.9)	56.9 (45.4-73.7)	157 (84.1-299)	317 (176-553)	729
Age 12-19 years (2005 - 2006)	34.8 (28.0-43.3)	32.5 (27.1-42.2)	79.5 (66.9-103)	213 (131-384)	424 (232-836)	702
Age 12-19 years (2007 - 2008)	29.8 (22.5-39.3)	26.6 (20.0-35.4)	66.7 (43.7-96.6)	224 (101-417)	417 (209-615)	401
Age 12-19 years (2009 - 2010)	15.3 (12.4-18.8)	14.9 (12.0-18.0)	28.8 (22.7-41.0)	70.2 (41.0-110)	117 (61.0-215)	420
Age 20+ years (2001 - 2002)	18.1 (15.7-20.9)	17.8 (14.7-20.7)	39.8 (32.7-48.0)	86.2 (65.7-107)	175 (110-279)	1647
Age 20+ years (2003 - 2004)	19.5 (17.7-21.5)	18.4 (16.6-21.0)	41.9 (36.9-51.2)	107 (88.2-136)	225 (148-384)	1534
Age 20+ years (2005 - 2006)	23.4 (21.1-25.9)	21.4 (19.5-23.7)	48.6 (43.7-55.1)	148 (121-172)	306 (238-421)	1490
Age 20+ years (2007 - 2008)	20.5 (17.4-24.1)	19.6 (17.1-22.2)	46.3 (37.2-59.9)	110 (75.0-169)	214 (157-303)	1814
Age 20+ years (2009 - 2010)	12.4 (10.7-14.3)	12.5 (10.8-14.3)	24.5 (21.1-29.3)	52.5 (40.1-72.6)	104 (72.6-151)	1914
Males (2001 - 2002)	22.0 (19.5-24.7)	21.2 (19.4-24.2)	48.0 (41.4-54.4)	94.2 (80.8-110)	212 (130-256)	1371
Males (2003 - 2004)	24.1 (20.9-27.9)	22.9 (19.2-27.9)	51.0 (40.5-59.8)	133 (94.8-220)	317 (162-470)	1250
Males (2005 - 2006)	29.6 (26.0-33.8)	27.2 (22.9-31.0)	63.1 (54.3-71.9)	180 (143-263)	494 (285-626)	1270
Males (2007 - 2008)	23.2 (19.4-27.8)	20.8 (18.1-24.5)	46.0 (39.2-57.3)	132 (85.4-190)	277 (162-349)	1294
Males (2009 - 2010)	15.2 (13.1-17.6)	14.6 (12.9-16.4)	29.5 (24.6-36.2)	71.0 (50.3-93.5)	128 (90.6-181)	1399
Females (2001 - 2002)	18.3 (15.7-21.4)	18.2 (14.9-22.1)	39.8 (34.3-46.0)	86.0 (69.4-115)	170 (119-273)	1411
Females (2003 - 2004)	19.7 (17.4-22.2)	19.4 (16.7-22.8)	46.4 (37.5-54.4)	103 (84.1-148)	214 (140-318)	1355
Females (2005 - 2006)	22.0 (19.2-25.2)	21.4 (19.5-23.4)	47.1 (42.6-54.3)	135 (113-156)	232 (186-300)	1278
Females (2007 - 2008)	21.0 (17.8-24.8)	19.9 (16.8-23.3)	51.0 (39.9-64.6)	121 (76.9-183)	223 (171-336)	1310
Females (2009 - 2010)	11.0 (9.58-12.8)	11.6 (9.73-13.5)	22.5 (19.2-27.2)	42.8 (33.2-59.1)	82.2 (53.1-116)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.0, 0.3, 0.7, 0.7, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP) (2001 – 2010)

CAS Number 40321-99-1

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	18.5 (16.2-21.1)	19.1 (16.3-21.6)	36.3 (31.6-44.0)	79.9 (66.4-93.9)	123 (100-161)	677
Mexican Americans (2003 - 2004)	18.9 (15.4-23.4)	19.8 (17.6-22.3)	37.5 (30.0-45.6)	72.2 (52.4-115)	116 (71.6-327)	652
Mexican Americans (2005 - 2006)	23.0 (18.0-29.3)	19.9 (15.7-23.9)	47.8 (34.8-65.3)	136 (84.6-223)	244 (157-520)	637
Mexican Americans (2007 - 2008)	22.7 (18.5-27.7)	19.8 (17.5-23.8)	43.6 (33.5-66.6)	104 (82.8-157)	238 (158-282)	531
Mexican Americans (2009 - 2010)	15.3 (12.9-18.2)	15.8 (13.3-18.3)	31.5 (26.6-39.2)	64.5 (46.4-94.9)	108 (70.7-153)	566
Non-Hispanic blacks (2001 - 2002)	29.8 (26.1-34.1)	30.9 (27.2-34.3)	61.9 (52.6-69.4)	126 (108-157)	276 (157-339)	703
Non-Hispanic blacks (2003 - 2004)	30.8 (26.8-35.5)	29.1 (25.3-32.3)	65.6 (53.7-76.3)	154 (113-178)	275 (174-401)	699
Non-Hispanic blacks (2005 - 2006)	34.8 (30.3-39.9)	30.2 (27.6-33.2)	73.8 (61.0-96.7)	206 (156-275)	395 (274-547)	678
Non-Hispanic blacks (2007 - 2008)	25.7 (23.1-28.6)	25.8 (22.4-28.9)	55.9 (47.1-64.7)	121 (99.1-150)	184 (137-255)	597
Non-Hispanic blacks (2009 - 2010)	15.5 (12.8-18.8)	15.7 (13.4-17.7)	30.4 (24.4-35.7)	54.5 (37.7-84.1)	94.6 (51.5-229)	516
Non-Hispanic whites (2001 - 2002)	19.1 (16.7-21.9)	19.2 (16.9-21.4)	41.7 (35.3-50.7)	91.1 (75.6-110)	212 (130-275)	1216
Non-Hispanic whites (2003 - 2004)	20.8 (18.6-23.3)	19.7 (17.2-22.5)	47.5 (39.4-56.1)	120 (91.3-165)	270 (155-403)	1088
Non-Hispanic whites (2005 - 2006)	24.3 (21.9-26.9)	23.0 (21.1-26.0)	54.6 (48.4-61.0)	148 (121-172)	302 (221-421)	1038
Non-Hispanic whites (2007 - 2008)	21.3 (17.6-25.8)	20.2 (16.5-24.1)	46.7 (36.1-65.2)	123 (75.1-203)	277 (161-373)	1077
Non-Hispanic whites (2009 - 2010)	12.2 (10.5-14.1)	12.3 (10.5-14.2)	24.4 (20.7-29.1)	51.7 (37.7-77.1)	104 (72.6-151)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.0, 0.3, 0.7, 0.7, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP) (2011 – 2016)

CAS Number 40321-99-1

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	7.91 (7.47-8.36)	8.30 (7.50-9.00)	16.0 (14.4-17.4)	29.0 (25.8-32.5)	43.1 (40.6-47.2)	2489
Total population (2013 - 2014)	6.47 (5.98-7.00)	6.90 (6.30-7.70)	13.2 (11.9-14.7)	23.7 (20.7-26.6)	33.7 (28.2-37.6)	2685
Total population (2015 - 2016)	5.67 (5.34-6.01)	5.70 (5.40-6.10)	10.8 (10.1-11.8)	18.9 (17.1-21.8)	28.3 (26.0-32.2)	2975
Age 3-5 years (2015 - 2016)	8.65 (7.86-9.52)	8.40 (7.40-9.60)	16.4 (13.9-19.0)	32.7 (26.2-42.5)	49.3 (42.5-54.3)	465
Age 6-11 years (2011 - 2012)	10.5 (8.82-12.4)	11.8 (10.4-14.2)	23.3 (19.9-26.1)	39.5 (30.6-50.3)	55.4 (41.8-68.5)	396
Age 6-11 years (2013 - 2014)	9.54 (7.94-11.5)	9.40 (7.50-12.8)	18.7 (16.2-23.0)	36.4 (26.5-44.8)	50.8 (37.3-76.5)	409
Age 6-11 years (2015 - 2016)	8.81 (7.83-9.90)	9.00 (7.90-10.0)	14.5 (13.3-17.1)	27.5 (20.0-35.9)	39.0 (31.7-47.9)	415
Age 12-19 years (2011 - 2012)	8.55 (6.93-10.6)	8.80 (6.80-10.6)	18.3 (14.3-23.2)	36.0 (27.4-46.6)	56.7 (38.1-99.8)	388
Age 12-19 years (2013 - 2014)	7.62 (6.43-9.04)	7.70 (6.20-10.3)	15.8 (12.3-19.3)	26.8 (21.9-32.5)	35.3 (27.6-59.5)	462
Age 12-19 years (2015 - 2016)	5.81 (4.93-6.84)	5.70 (5.00-7.20)	11.0 (9.00-12.7)	17.3 (13.8-22.5)	25.3 (17.6-29.3)	405
Age 20+ years (2011 - 2012)	7.58 (7.03-8.16)	8.00 (7.20-8.90)	15.0 (13.5-16.9)	26.7 (23.8-30.6)	41.5 (34.7-46.2)	1705
Age 20+ years (2013 - 2014)	6.06 (5.63-6.51)	6.70 (5.70-7.30)	12.3 (11.3-13.4)	22.3 (19.6-24.0)	30.3 (26.5-35.9)	1814
Age 20+ years (2015 - 2016)	5.29 (5.00-5.61)	5.40 (5.00-5.70)	10.2 (9.30-11.0)	18.5 (16.2-20.5)	26.5 (24.1-32.2)	1690
Males (2011 - 2012)	8.71 (7.98-9.51)	9.40 (7.80-10.6)	16.4 (14.2-19.5)	31.1 (26.7-35.8)	46.2 (41.5-55.4)	1259
Males (2013 - 2014)	6.98 (6.32-7.71)	7.40 (6.70-8.40)	13.1 (11.7-14.8)	22.7 (20.1-24.9)	32.9 (27.3-36.0)	1285
Males (2015 - 2016)	6.11 (5.71-6.54)	6.00 (5.50-6.90)	11.6 (10.2-12.5)	20.1 (18.3-23.2)	29.3 (24.1-43.8)	1474
Females (2011 - 2012)	7.20 (6.77-7.66)	7.60 (6.90-8.20)	15.5 (14.4-17.1)	27.6 (25.0-30.5)	40.7 (35.1-46.4)	1230
Females (2013 - 2014)	6.02 (5.40-6.72)	6.30 (5.30-7.20)	13.4 (11.5-15.3)	24.8 (20.7-27.8)	35.3 (27.4-40.8)	1400
Females (2015 - 2016)	5.27 (4.89-5.66)	5.40 (4.90-5.70)	10.4 (9.70-11.0)	18.0 (15.5-22.1)	27.9 (22.6-34.2)	1501
Mexican Americans (2011 - 2012)	9.13 (7.22-11.5)	9.60 (7.30-11.7)	17.7 (12.7-24.7)	32.1 (24.8-37.7)	50.2 (36.4-56.3)	316
Mexican Americans (2013 - 2014)	7.71 (6.53-9.10)	8.00 (7.40-8.80)	14.4 (12.5-16.2)	28.1 (18.9-42.0)	43.7 (31.8-50.3)	438
Mexican Americans (2015 - 2016)	6.39 (5.71-7.14)	6.30 (5.60-7.30)	12.4 (9.90-16.0)	22.3 (18.9-27.0)	34.7 (25.1-48.6)	595
Non-Hispanic blacks (2011 - 2012)	11.3 (10.1-12.7)	11.2 (10.2-12.7)	22.1 (17.4-26.8)	38.8 (34.9-47.9)	56.2 (46.8-65.1)	665
Non-Hispanic blacks (2013 - 2014)	8.06 (6.79-9.56)	8.80 (7.30-10.4)	16.5 (14.0-18.6)	27.4 (22.8-32.7)	38.7 (32.7-48.1)	609
Non-Hispanic blacks (2015 - 2016)	7.48 (6.44-8.69)	7.20 (6.40-8.10)	13.5 (11.6-16.4)	26.0 (21.5-34.0)	45.8 (29.9-59.5)	698
Non-Hispanic whites (2011 - 2012)	7.20 (6.73-7.70)	7.40 (6.80-8.30)	14.6 (12.9-17.2)	25.0 (23.4-27.9)	36.6 (30.6-42.9)	813
Non-Hispanic whites (2013 - 2014)	6.05 (5.54-6.61)	6.70 (5.60-7.20)	12.6 (10.8-14.2)	22.4 (19.1-24.6)	30.1 (26.3-35.3)	987
Non-Hispanic whites (2015 - 2016)	5.15 (4.71-5.63)	5.30 (4.80-5.90)	10.1 (8.90-11.0)	16.5 (14.8-19.4)	24.8 (19.5-32.2)	862
All Hispanics (2011 - 2012)	9.28 (8.07-10.7)	9.40 (7.70-10.8)	18.8 (15.3-22.9)	37.5 (32.1-43.9)	53.8 (46.3-70.6)	571
All Hispanics (2013 - 2014)	7.56 (6.92-8.26)	8.00 (7.40-8.60)	14.4 (13.1-15.5)	27.2 (21.3-37.3)	39.3 (35.1-46.4)	690
All Hispanics (2015 - 2016)	6.21 (5.58-6.91)	6.20 (5.50-7.20)	12.0 (10.2-13.9)	21.2 (18.6-22.8)	30.6 (26.0-39.1)	971
Asians (2011 - 2012)	6.85 (5.53-8.48)	6.70 (5.40-7.90)	15.1 (11.5-18.6)	31.8 (22.5-41.9)	64.2 (35.7-82.8)	352
Asians (2013 - 2014)	4.78 (4.07-5.61)	4.50 (3.70-5.60)	10.2 (8.30-12.4)	17.1 (14.6-21.8)	26.7 (17.9-47.0)	289
Asians (2015 - 2016)	6.04 (5.36-6.80)	6.10 (5.00-7.00)	12.7 (10.9-15.8)	27.2 (20.1-32.1)	41.6 (27.6-65.3)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.2, 0.4, and 0.4, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP) (creatinine corrected) (2001 – 2010)

CAS Number 40321-99-1

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	18.8 (17.0-20.7)	16.6 (14.9-18.5)	32.2 (27.8-37.1)	71.1 (58.7-88.3)	143 (101-200)	2782
Total population (2003 - 2004)	20.4 (18.7-22.3)	17.7 (16.3-19.6)	35.8 (30.5-43.3)	93.5 (74.0-128)	182 (134-262)	2605
Total population (2005 - 2006)	24.8 (22.4-27.5)	21.4 (19.1-23.4)	46.1 (40.0-52.1)	117 (97.8-148)	235 (197-272)	2548
Total population (2007 - 2008)	22.2 (19.4-25.5)	19.3 (17.4-22.1)	40.5 (34.1-50.3)	99.3 (69.7-134)	179 (135-252)	2604
Total population (2009 - 2010)	13.5 (11.6-15.6)	11.9 (10.5-13.9)	22.3 (18.6-26.4)	44.0 (35.3-61.0)	86.3 (59.2-131)	2749
Age 6-11 years (2001 - 2002)	38.2 (34.3-42.6)	34.3 (29.9-38.9)	60.6 (51.9-76.4)	107 (96.3-147)	211 (122-313)	393
Age 6-11 years (2003 - 2004)	39.0 (31.1-48.9)	36.6 (25.3-49.3)	65.6 (49.8-91.3)	129 (77.1-253)	211 (123-708)	342
Age 6-11 years (2005 - 2006)	38.5 (34.2-43.3)	37.0 (32.9-40.3)	65.5 (55.4-71.9)	115 (85.1-165)	213 (119-333)	356
Age 6-11 years (2007 - 2008)	35.2 (29.1-42.5)	31.4 (25.6-37.8)	53.5 (44.8-72.3)	139 (79.9-230)	258 (141-303)	389
Age 6-11 years (2009 - 2010)	19.6 (17.3-22.2)	18.6 (16.5-21.5)	34.2 (27.3-40.4)	55.4 (44.0-64.8)	72.1 (56.3-140)	415
Age 12-19 years (2001 - 2002)	19.2 (17.0-21.8)	17.8 (15.6-20.0)	34.9 (29.2-42.7)	73.4 (58.4-80.7)	102 (86.6-160)	742
Age 12-19 years (2003 - 2004)	21.2 (18.1-24.7)	18.6 (16.9-21.7)	38.7 (29.7-53.4)	103 (62.7-209)	212 (100-358)	729
Age 12-19 years (2005 - 2006)	26.0 (21.2-31.7)	23.7 (18.8-28.4)	49.4 (37.4-74.0)	131 (79.0-228)	278 (132-375)	702
Age 12-19 years (2007 - 2008)	23.2 (18.1-29.6)	20.0 (14.6-23.9)	46.1 (31.5-66.3)	148 (66.6-234)	234 (146-373)	401
Age 12-19 years (2009 - 2010)	12.3 (9.73-15.5)	10.5 (8.95-13.3)	20.9 (14.2-31.0)	45.3 (28.9-91.9)	110 (44.6-200)	420
Age 20+ years (2001 - 2002)	17.1 (15.2-19.3)	15.0 (13.3-16.7)	27.7 (23.2-34.0)	63.7 (48.3-86.9)	137 (84.4-203)	1647
Age 20+ years (2003 - 2004)	18.8 (17.5-20.2)	16.3 (15.4-17.5)	31.6 (28.1-35.3)	83.8 (67.2-106)	171 (129-246)	1534
Age 20+ years (2005 - 2006)	23.4 (21.1-26.0)	19.4 (17.6-21.8)	42.5 (37.6-49.2)	115 (93.1-153)	235 (184-298)	1490
Age 20+ years (2007 - 2008)	21.0 (18.5-24.0)	18.5 (16.3-20.2)	38.1 (30.9-49.2)	94.3 (62.6-126)	164 (120-235)	1814
Age 20+ years (2009 - 2010)	13.1 (11.3-15.2)	11.5 (10.1-13.4)	20.9 (17.7-25.1)	40.6 (32.4-64.9)	86.3 (59.2-131)	1914
Males (2001 - 2002)	17.9 (16.2-19.7)	15.4 (13.8-17.9)	32.2 (27.8-36.8)	73.4 (55.3-91.8)	137 (97.7-224)	1371
Males (2003 - 2004)	18.9 (17.1-20.9)	17.1 (15.2-18.6)	32.7 (26.6-41.6)	93.4 (68.8-123)	193 (108-291)	1250
Males (2005 - 2006)	23.8 (21.0-26.9)	20.2 (17.5-23.3)	44.8 (38.5-54.1)	129 (92.5-166)	251 (202-352)	1270
Males (2007 - 2008)	19.6 (16.8-22.7)	16.8 (14.6-20.0)	34.8 (28.7-41.8)	90.3 (65.2-119)	164 (111-258)	1294
Males (2009 - 2010)	13.6 (11.7-15.9)	11.6 (10.5-13.1)	22.9 (17.8-27.4)	52.8 (39.1-74.3)	103 (73.3-173)	1399
Females (2001 - 2002)	19.7 (17.3-22.4)	17.6 (15.4-19.5)	32.1 (26.8-38.6)	70.5 (57.8-93.7)	156 (93.7-201)	1411
Females (2003 - 2004)	21.9 (19.7-24.5)	18.7 (16.8-20.9)	39.3 (33.8-46.9)	94.3 (72.8-136)	171 (146-261)	1355
Females (2005 - 2006)	25.9 (23.2-28.8)	22.5 (19.6-25.5)	47.3 (40.5-52.3)	108 (88.8-131)	202 (157-278)	1278
Females (2007 - 2008)	25.2 (22.1-28.6)	22.1 (19.6-24.4)	47.4 (38.5-56.1)	112 (84.6-150)	190 (162-268)	1310
Females (2009 - 2010)	13.3 (11.4-15.6)	12.4 (10.4-14.6)	21.9 (18.3-26.7)	38.8 (30.9-52.2)	74.0 (46.9-115)	1350

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP) (creatinine corrected) (2001 – 2010)

CAS Number 40321-99-1

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	17.4 (15.9-19.1)	15.7 (14.4-17.5)	30.6 (26.0-34.7)	65.9 (50.6-83.9)	103 (75.5-128)	677
Mexican Americans (2003 - 2004)	17.1 (14.3-20.4)	15.4 (13.2-17.7)	29.3 (23.8-36.8)	57.3 (45.7-97.6)	105 (70.1-195)	652
Mexican Americans (2005 - 2006)	20.7 (17.2-25.0)	17.5 (15.3-21.3)	37.3 (30.9-45.7)	99.9 (67.6-159)	181 (110-357)	637
Mexican Americans (2007 - 2008)	22.1 (17.7-27.7)	18.8 (15.2-23.4)	38.6 (28.3-54.9)	91.4 (61.0-170)	197 (141-282)	531
Mexican Americans (2009 - 2010)	15.2 (12.9-17.8)	14.6 (12.8-16.2)	27.0 (21.3-33.3)	60.0 (42.3-77.7)	94.8 (66.4-142)	566
Non-Hispanic blacks (2001 - 2002)	20.9 (18.8-23.3)	19.7 (17.5-21.8)	38.3 (32.1-46.0)	93.5 (69.2-123)	164 (130-183)	703
Non-Hispanic blacks (2003 - 2004)	21.9 (20.1-23.8)	19.5 (17.3-22.6)	40.1 (35.8-45.3)	102 (75.5-122)	164 (133-269)	699
Non-Hispanic blacks (2005 - 2006)	24.5 (21.2-28.2)	18.9 (17.1-22.8)	46.1 (37.9-59.7)	128 (100-158)	308 (158-399)	678
Non-Hispanic blacks (2007 - 2008)	20.0 (18.1-22.0)	18.3 (16.5-19.2)	36.9 (27.9-46.7)	85.5 (65.8-103)	136 (107-227)	597
Non-Hispanic blacks (2009 - 2010)	11.2 (8.71-14.5)	10.5 (8.26-13.5)	18.9 (13.6-25.3)	32.9 (22.3-58.4)	47.2 (33.6-153)	516
Non-Hispanic whites (2001 - 2002)	18.9 (17.0-21.0)	16.3 (14.8-18.4)	32.1 (27.3-37.3)	70.8 (56.9-93.7)	177 (98.0-242)	1216
Non-Hispanic whites (2003 - 2004)	20.5 (18.5-22.8)	17.8 (16.2-19.7)	35.3 (29.7-44.9)	96.2 (75.8-136)	211 (136-283)	1088
Non-Hispanic whites (2005 - 2006)	25.6 (23.1-28.2)	22.4 (19.6-24.5)	47.6 (40.7-54.1)	119 (98.2-148)	231 (181-297)	1038
Non-Hispanic whites (2007 - 2008)	22.2 (18.7-26.3)	19.5 (16.7-23.0)	40.4 (32.1-54.8)	99.1 (68.1-145)	179 (129-258)	1077
Non-Hispanic whites (2009 - 2010)	13.7 (11.7-16.1)	11.9 (10.4-13.9)	22.4 (18.0-27.6)	43.0 (34.2-61.0)	84.1 (54.7-142)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP) (creatinine corrected) (2011 – 2016)

CAS Number 40321-99-1

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	8.99 (8.55-9.46)	8.46 (7.90-9.27)	14.1 (13.5-14.9)	25.3 (23.1-27.8)	37.7 (32.9-45.3)	2487
Total population (2013 - 2014)	6.49 (5.97-7.05)	6.15 (5.67-6.86)	10.5 (9.47-11.7)	18.1 (15.4-20.4)	25.8 (22.9-29.3)	2684
Total population (2015 - 2016)	5.86 (5.62-6.12)	5.53 (5.25-5.77)	9.19 (8.66-9.76)	16.4 (15.3-18.0)	27.2 (22.9-30.0)	2974
Age 3-5 years (2015 - 2016)	20.6 (19.2-22.2)	20.0 (18.0-22.3)	33.7 (30.0-39.2)	54.5 (50.1-62.8)	75.1 (62.9-91.4)	464
Age 6-11 years (2011 - 2012)	14.9 (12.9-17.2)	14.8 (13.0-18.2)	26.5 (22.9-28.2)	42.6 (30.9-46.5)	58.1 (43.2-75.1)	395
Age 6-11 years (2013 - 2014)	12.0 (10.4-14.0)	11.6 (9.32-14.4)	19.3 (17.2-24.2)	36.9 (24.6-61.7)	61.7 (34.3-130)	409
Age 6-11 years (2015 - 2016)	11.3 (10.5-12.3)	10.5 (9.57-11.6)	16.3 (14.7-19.1)	28.8 (21.7-35.2)	36.6 (31.7-44.4)	415
Age 12-19 years (2011 - 2012)	8.33 (7.38-9.41)	7.60 (6.41-8.29)	12.6 (10.4-15.5)	28.7 (20.1-37.2)	53.9 (31.7-68.8)	388
Age 12-19 years (2013 - 2014)	6.19 (5.36-7.14)	5.94 (5.00-7.14)	9.82 (8.59-11.5)	16.9 (13.0-21.1)	24.8 (19.9-31.1)	462
Age 12-19 years (2015 - 2016)	4.51 (4.18-4.87)	4.38 (4.01-4.95)	6.71 (6.02-7.78)	10.3 (8.60-12.6)	13.7 (10.2-19.1)	405
Age 20+ years (2011 - 2012)	8.61 (8.17-9.07)	8.20 (7.63-8.94)	13.5 (12.6-14.1)	22.5 (20.1-25.3)	32.0 (28.1-39.3)	1704
Age 20+ years (2013 - 2014)	6.10 (5.62-6.63)	5.93 (5.40-6.41)	9.81 (8.89-10.8)	15.4 (14.1-18.3)	22.2 (19.2-26.0)	1813
Age 20+ years (2015 - 2016)	5.40 (5.13-5.68)	5.15 (4.85-5.43)	8.10 (7.69-8.84)	13.5 (12.4-15.5)	20.9 (17.6-27.2)	1690
Males (2011 - 2012)	8.15 (7.67-8.66)	7.80 (7.18-8.21)	12.2 (11.5-13.2)	24.2 (20.9-25.9)	37.2 (29.5-50.2)	1258
Males (2013 - 2014)	5.86 (5.38-6.39)	5.68 (5.26-6.12)	8.97 (8.48-9.79)	15.2 (13.9-16.7)	22.3 (19.8-26.3)	1284
Males (2015 - 2016)	5.45 (5.04-5.89)	5.14 (4.66-5.62)	8.60 (7.78-9.31)	15.4 (12.9-18.2)	24.0 (18.3-33.3)	1474
Females (2011 - 2012)	9.89 (9.16-10.7)	9.64 (8.33-11.1)	15.6 (14.7-17.3)	27.0 (23.9-28.8)	37.7 (33.2-44.4)	1229
Females (2013 - 2014)	7.15 (6.38-8.01)	6.94 (6.25-7.58)	12.0 (10.3-13.7)	20.4 (16.4-23.6)	28.3 (22.9-36.4)	1400
Females (2015 - 2016)	6.29 (5.99-6.61)	5.86 (5.50-6.25)	9.90 (9.00-10.5)	17.7 (15.5-19.9)	28.4 (23.3-30.5)	1500
Mexican Americans (2011 - 2012)	10.3 (8.35-12.7)	9.10 (7.02-12.5)	18.6 (14.4-21.1)	30.4 (25.1-36.0)	49.6 (30.4-114)	316
Mexican Americans (2013 - 2014)	7.86 (7.13-8.66)	7.54 (6.78-8.10)	12.6 (10.8-16.5)	23.5 (19.6-32.1)	37.2 (25.8-54.9)	438
Mexican Americans (2015 - 2016)	6.96 (6.42-7.54)	6.87 (6.19-7.88)	11.4 (10.5-12.9)	20.3 (16.7-27.4)	33.6 (25.3-40.0)	595
Non-Hispanic blacks (2011 - 2012)	8.80 (7.84-9.87)	8.12 (7.37-8.96)	14.7 (12.4-17.8)	28.2 (20.7-37.4)	46.2 (29.7-57.5)	665
Non-Hispanic blacks (2013 - 2014)	5.94 (5.28-6.70)	5.68 (4.84-6.85)	9.94 (9.02-11.4)	17.1 (15.0-20.1)	23.9 (19.2-32.4)	609
Non-Hispanic blacks (2015 - 2016)	5.96 (5.46-6.51)	5.43 (4.77-6.07)	10.4 (9.06-12.3)	19.3 (16.6-22.1)	30.0 (23.8-38.8)	697
Non-Hispanic whites (2011 - 2012)	8.74 (8.02-9.53)	8.36 (7.62-9.58)	13.5 (12.5-14.5)	23.1 (19.7-25.9)	32.7 (27.8-42.9)	811
Non-Hispanic whites (2013 - 2014)	6.37 (5.74-7.07)	6.06 (5.56-6.74)	10.0 (8.72-11.6)	16.2 (14.2-20.0)	23.1 (20.8-27.7)	987
Non-Hispanic whites (2015 - 2016)	5.54 (5.16-5.94)	5.34 (4.96-5.60)	8.33 (7.69-8.96)	13.9 (12.3-18.2)	21.8 (18.3-27.8)	862
All Hispanics (2011 - 2012)	10.4 (9.42-11.5)	9.29 (8.14-10.5)	18.7 (16.7-21.1)	30.5 (27.1-35.6)	49.6 (33.4-67.9)	571
All Hispanics (2013 - 2014)	7.50 (7.04-8.00)	7.19 (6.58-7.77)	12.3 (11.1-14.1)	22.3 (19.0-27.0)	34.9 (27.1-40.6)	690
All Hispanics (2015 - 2016)	6.54 (6.09-7.03)	6.32 (5.77-6.97)	10.6 (10.0-11.5)	18.3 (16.7-21.1)	30.0 (24.5-34.6)	971
Asians (2011 - 2012)	9.18 (7.54-11.2)	8.45 (7.34-10.0)	16.2 (12.7-21.0)	33.0 (23.6-42.6)	57.4 (35.8-85.4)	352
Asians (2013 - 2014)	6.06 (5.35-6.86)	5.63 (4.83-6.50)	11.0 (9.79-13.2)	19.6 (16.0-24.5)	26.3 (19.6-41.9)	288
Asians (2015 - 2016)	7.47 (6.41-8.72)	6.03 (5.45-7.61)	12.6 (10.4-16.5)	30.9 (19.3-41.6)	43.2 (33.5-72.8)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP) (2001 – 2010)

CAS Number 40321-98-0

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	13.5 (12.0-15.0)	14.0 (12.5-15.1)	29.6 (25.2-34.0)	59.9 (50.4-70.9)	120 (87.2-156)	2782
Total population (2003 - 2004)	14.5 (13.0-16.1)	14.4 (12.4-16.7)	31.4 (27.4-36.6)	76.7 (59.4-102)	157 (106-232)	2605
Total population (2005 - 2006)	16.2 (14.6-18.0)	15.1 (13.5-17.1)	35.5 (32.1-40.3)	94.8 (78.5-112)	183 (147-250)	2548
Total population (2007 - 2008)	12.2 (10.3-14.3)	11.3 (10.0-13.3)	27.1 (21.8-33.8)	64.2 (47.3-93.6)	130 (93.6-177)	2604
Total population (2009 - 2010)	8.02 (7.11-9.06)	8.02 (7.27-9.04)	16.1 (13.8-19.0)	32.5 (25.2-41.8)	55.7 (41.8-80.9)	2749
Age 6-11 years (2001 - 2002)	23.3 (20.9-26.1)	22.9 (18.5-28.1)	46.5 (38.1-52.0)	81.6 (64.7-109)	142 (93.9-178)	393
Age 6-11 years (2003 - 2004)	25.1 (19.6-32.3)	25.8 (19.3-31.4)	51.1 (32.1-76.5)	97.9 (58.8-197)	197 (97.6-261)	342
Age 6-11 years (2005 - 2006)	23.0 (20.3-26.1)	24.5 (19.9-27.6)	44.3 (38.1-52.3)	83.8 (63.6-115)	126 (77.3-253)	356
Age 6-11 years (2007 - 2008)	16.9 (13.9-20.6)	16.6 (12.4-22.6)	34.5 (26.2-40.9)	64.4 (46.9-129)	137 (63.8-179)	389
Age 6-11 years (2009 - 2010)	9.78 (8.72-11.0)	11.1 (8.87-12.7)	20.0 (17.1-21.6)	35.4 (24.8-41.4)	48.4 (36.0-74.0)	415
Age 12-19 years (2001 - 2002)	17.5 (15.1-20.3)	18.6 (16.2-20.7)	35.0 (27.7-42.1)	70.7 (52.2-104)	118 (74.0-174)	742
Age 12-19 years (2003 - 2004)	19.5 (16.0-23.7)	20.3 (18.4-23.5)	37.8 (32.6-44.6)	110 (54.6-168)	212 (103-326)	729
Age 12-19 years (2005 - 2006)	23.0 (18.7-28.4)	22.1 (18.0-26.2)	50.7 (42.7-62.2)	134 (82.3-240)	263 (134-511)	702
Age 12-19 years (2007 - 2008)	16.9 (12.8-22.3)	15.9 (11.9-19.3)	38.2 (24.0-55.5)	121 (58.1-258)	258 (120-354)	401
Age 12-19 years (2009 - 2010)	10.0 (8.32-12.1)	9.82 (7.96-12.3)	19.0 (15.9-23.5)	40.0 (26.7-61.5)	68.4 (32.6-154)	420
Age 20+ years (2001 - 2002)	12.0 (10.5-13.9)	12.3 (10.4-14.1)	26.0 (21.6-32.1)	52.3 (41.8-68.3)	116 (74.9-160)	1647
Age 20+ years (2003 - 2004)	12.9 (11.8-14.1)	12.4 (10.9-14.5)	27.0 (25.0-30.9)	68.9 (55.0-86.5)	139 (92.7-216)	1534
Age 20+ years (2005 - 2006)	14.7 (13.2-16.4)	13.4 (12.2-15.1)	31.9 (28.2-36.2)	91.6 (74.6-104)	182 (138-247)	1490
Age 20+ years (2007 - 2008)	11.1 (9.48-13.1)	10.7 (9.30-12.3)	25.5 (20.2-31.4)	59.8 (42.3-88.9)	108 (80.0-155)	1814
Age 20+ years (2009 - 2010)	7.59 (6.64-8.68)	7.55 (6.69-8.58)	15.3 (12.6-18.6)	30.6 (24.1-41.5)	54.9 (41.8-81.0)	1914
Males (2001 - 2002)	14.5 (13.0-16.2)	14.6 (13.1-16.2)	31.6 (25.6-34.7)	60.4 (52.3-71.4)	129 (84.4-167)	1371
Males (2003 - 2004)	15.6 (13.6-17.9)	14.7 (12.7-18.1)	31.8 (27.2-39.5)	83.8 (59.4-134)	185 (96.2-277)	1250
Males (2005 - 2006)	18.3 (16.0-20.9)	16.3 (14.7-19.7)	39.3 (33.4-48.1)	104 (80.7-140)	258 (180-337)	1270
Males (2007 - 2008)	12.5 (10.5-15.0)	11.3 (9.80-13.4)	26.1 (21.8-32.2)	61.8 (46.8-98.1)	139 (83.7-189)	1294
Males (2009 - 2010)	9.14 (8.01-10.4)	8.76 (7.87-9.88)	18.2 (14.8-21.0)	39.3 (27.5-50.9)	69.6 (50.0-109)	1399
Females (2001 - 2002)	12.5 (10.8-14.6)	13.1 (11.2-15.0)	28.1 (23.7-33.5)	57.5 (45.8-72.7)	115 (81.8-147)	1411
Females (2003 - 2004)	13.4 (11.9-15.1)	13.7 (11.4-16.4)	29.5 (26.1-36.6)	68.6 (53.7-88.1)	143 (88.2-210)	1355
Females (2005 - 2006)	14.4 (12.6-16.5)	13.8 (12.5-15.7)	32.5 (29.3-36.4)	81.7 (68.6-104)	159 (114-182)	1278
Females (2007 - 2008)	11.8 (10.0-14.0)	11.7 (9.80-13.5)	27.9 (21.3-37.5)	64.2 (43.9-93.6)	122 (92.0-191)	1310
Females (2009 - 2010)	7.09 (6.17-8.14)	7.35 (6.13-8.67)	15.2 (12.1-17.5)	27.1 (21.6-36.9)	48.2 (31.3-67.1)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.1, 0.5, 0.7, 0.6, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP) (2001 – 2010)

CAS Number 40321-98-0

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	13.1 (11.6-14.9)	13.4 (11.6-15.0)	25.5 (21.6-30.8)	56.6 (40.6-70.3)	77.3 (70.5-101)	677
Mexican Americans (2003 - 2004)	12.8 (10.5-15.5)	13.6 (11.4-15.6)	25.3 (20.4-29.9)	46.6 (32.3-70.8)	76.0 (51.6-153)	652
Mexican Americans (2005 - 2006)	14.8 (11.7-18.8)	12.8 (10.5-16.1)	30.9 (22.6-42.9)	79.1 (51.7-131)	152 (92.9-276)	637
Mexican Americans (2007 - 2008)	12.6 (10.5-15.1)	11.4 (10.4-12.9)	25.1 (18.7-37.2)	53.4 (43.2-91.7)	118 (88.4-147)	531
Mexican Americans (2009 - 2010)	9.57 (8.10-11.3)	9.65 (8.17-11.3)	19.2 (16.3-23.3)	39.0 (30.9-54.7)	64.6 (43.0-95.3)	566
Non-Hispanic blacks (2001 - 2002)	19.6 (17.1-22.5)	20.1 (17.9-22.4)	39.0 (34.8-44.2)	80.5 (71.4-97.4)	153 (102-228)	703
Non-Hispanic blacks (2003 - 2004)	20.2 (17.7-23.0)	20.1 (17.0-22.5)	40.0 (33.9-46.9)	92.6 (68.8-130)	173 (104-247)	699
Non-Hispanic blacks (2005 - 2006)	21.8 (18.9-25.2)	18.8 (16.8-21.0)	46.0 (38.0-59.1)	130 (104-168)	243 (159-304)	678
Non-Hispanic blacks (2007 - 2008)	14.2 (12.7-15.9)	14.0 (12.7-16.3)	30.5 (25.8-35.9)	64.2 (52.1-76.1)	110 (71.9-136)	597
Non-Hispanic blacks (2009 - 2010)	9.57 (8.17-11.2)	9.64 (8.15-11.1)	19.8 (16.5-22.1)	31.4 (25.5-44.0)	50.9 (31.4-129)	516
Non-Hispanic whites (2001 - 2002)	12.8 (11.2-14.6)	13.2 (11.6-14.6)	28.5 (23.6-34.0)	58.6 (48.8-70.9)	126 (83.7-172)	1216
Non-Hispanic whites (2003 - 2004)	13.8 (12.4-15.4)	13.4 (11.3-16.3)	31.0 (27.0-36.3)	77.6 (59.4-102)	161 (98.7-241)	1088
Non-Hispanic whites (2005 - 2006)	15.5 (13.9-17.3)	15.0 (13.3-16.5)	35.3 (30.1-40.8)	92.6 (74.6-111)	182 (134-247)	1038
Non-Hispanic whites (2007 - 2008)	11.7 (9.66-14.2)	11.0 (9.20-13.6)	26.9 (20.2-35.1)	64.2 (43.4-108)	137 (90.0-197)	1077
Non-Hispanic whites (2009 - 2010)	7.59 (6.60-8.73)	7.55 (6.81-8.63)	15.7 (12.9-18.6)	29.1 (22.9-46.5)	55.7 (41.5-83.5)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.1, 0.5, 0.7, 0.6, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP) (2011 – 2016)

CAS Number 40321-98-0

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	5.08 (4.78-5.41)	5.30 (4.90-5.80)	10.3 (9.40-11.5)	18.4 (17.0-19.5)	26.5 (23.7-30.2)	2489
Total population (2013 - 2014)	4.24 (3.94-4.57)	4.70 (4.20-5.00)	8.50 (7.60-9.30)	15.2 (13.3-17.3)	20.2 (18.2-23.7)	2685
Total population (2015 - 2016)	3.57 (3.31-3.86)	3.70 (3.40-4.10)	7.00 (6.40-7.80)	12.1 (10.9-13.7)	19.0 (16.1-21.4)	2975
Age 3-5 years (2015 - 2016)	5.80 (5.28-6.38)	5.70 (5.00-6.50)	11.0 (9.80-12.7)	22.1 (17.3-26.3)	30.2 (26.2-36.6)	465
Age 6-11 years (2011 - 2012)	6.96 (5.86-8.28)	8.10 (6.90-9.70)	14.6 (12.8-17.1)	26.1 (22.6-28.4)	34.7 (27.9-42.5)	396
Age 6-11 years (2013 - 2014)	6.51 (5.49-7.72)	6.60 (5.10-8.30)	12.4 (10.2-16.4)	23.4 (17.1-30.0)	33.0 (24.2-50.7)	409
Age 6-11 years (2015 - 2016)	5.97 (5.35-6.67)	6.10 (5.30-6.80)	10.0 (8.80-12.1)	19.0 (14.7-21.5)	24.5 (19.6-33.7)	415
Age 12-19 years (2011 - 2012)	5.70 (4.64-7.01)	5.70 (4.60-7.30)	12.2 (10.5-13.7)	22.2 (19.1-29.5)	35.1 (23.0-46.8)	388
Age 12-19 years (2013 - 2014)	5.34 (4.57-6.24)	5.50 (4.40-7.00)	10.5 (8.10-13.3)	17.5 (14.9-23.8)	25.6 (17.6-33.7)	462
Age 12-19 years (2015 - 2016)	3.75 (3.16-4.46)	3.80 (3.20-4.70)	6.90 (6.00-8.60)	10.9 (9.10-14.7)	16.2 (11.5-19.2)	405
Age 20+ years (2011 - 2012)	4.83 (4.45-5.23)	5.10 (4.70-5.60)	9.60 (8.50-10.8)	16.7 (14.5-18.6)	23.0 (20.8-26.5)	1705
Age 20+ years (2013 - 2014)	3.91 (3.65-4.19)	4.40 (3.90-4.80)	7.80 (7.10-8.70)	13.9 (12.1-15.7)	19.1 (17.1-20.8)	1814
Age 20+ years (2015 - 2016)	3.29 (3.05-3.56)	3.50 (3.00-3.80)	6.50 (5.90-7.30)	11.4 (10.2-13.1)	18.2 (14.3-20.3)	1690
Males (2011 - 2012)	5.50 (5.07-5.95)	5.70 (5.10-6.30)	10.5 (8.90-12.2)	18.7 (16.9-21.2)	28.1 (23.4-34.3)	1259
Males (2013 - 2014)	4.45 (4.05-4.89)	4.90 (4.40-5.30)	8.10 (7.30-9.00)	13.7 (12.6-15.9)	19.8 (17.3-23.6)	1285
Males (2015 - 2016)	3.74 (3.44-4.08)	4.00 (3.40-4.40)	7.00 (6.40-8.00)	12.2 (10.9-14.7)	19.6 (15.4-26.9)	1474
Females (2011 - 2012)	4.71 (4.39-5.07)	5.00 (4.70-5.60)	10.2 (9.20-11.1)	18.1 (15.8-19.3)	25.4 (21.9-29.6)	1230
Females (2013 - 2014)	4.06 (3.65-4.50)	4.20 (3.60-4.80)	9.00 (7.70-9.90)	16.2 (13.9-18.2)	21.5 (17.6-25.5)	1400
Females (2015 - 2016)	3.42 (3.14-3.72)	3.50 (3.20-3.90)	7.00 (6.20-7.80)	12.0 (10.1-14.6)	17.1 (15.1-20.8)	1501
Mexican Americans (2011 - 2012)	5.86 (4.69-7.33)	5.90 (4.40-7.50)	11.6 (8.40-14.4)	20.5 (15.4-25.4)	31.5 (22.5-35.1)	316
Mexican Americans (2013 - 2014)	5.03 (4.21-6.01)	5.20 (4.60-5.80)	9.40 (7.70-11.5)	18.3 (12.3-24.2)	25.1 (19.5-34.3)	438
Mexican Americans (2015 - 2016)	3.96 (3.53-4.45)	4.00 (3.50-4.60)	8.00 (6.10-9.90)	14.5 (11.6-16.0)	20.8 (15.4-31.3)	595
Non-Hispanic blacks (2011 - 2012)	7.30 (6.48-8.22)	7.40 (6.70-8.00)	14.0 (11.5-16.0)	26.0 (21.1-32.1)	36.9 (30.8-48.2)	665
Non-Hispanic blacks (2013 - 2014)	5.38 (4.58-6.31)	5.80 (5.00-7.00)	10.8 (9.10-12.0)	17.5 (15.2-21.8)	25.3 (21.7-29.7)	609
Non-Hispanic blacks (2015 - 2016)	4.59 (3.93-5.37)	4.50 (4.20-4.90)	8.60 (7.80-9.50)	16.6 (13.0-21.7)	28.7 (17.9-40.0)	698
Non-Hispanic whites (2011 - 2012)	4.62 (4.31-4.96)	4.90 (4.50-5.50)	9.50 (8.40-10.8)	16.1 (13.8-18.6)	21.2 (19.0-25.9)	813
Non-Hispanic whites (2013 - 2014)	3.95 (3.63-4.30)	4.40 (3.90-4.80)	7.90 (7.00-9.10)	14.2 (12.0-16.5)	19.1 (16.5-23.4)	987
Non-Hispanic whites (2015 - 2016)	3.30 (2.95-3.68)	3.50 (2.90-4.00)	6.50 (5.90-7.30)	10.7 (9.40-12.7)	16.6 (12.8-20.3)	862
All Hispanics (2011 - 2012)	5.94 (5.17-6.83)	6.00 (4.80-7.30)	11.8 (9.70-14.0)	22.5 (19.8-25.8)	34.3 (26.2-39.8)	571
All Hispanics (2013 - 2014)	4.95 (4.46-5.49)	5.30 (4.80-5.70)	9.20 (8.30-10.4)	17.5 (12.9-20.2)	24.2 (19.7-28.5)	690
All Hispanics (2015 - 2016)	3.88 (3.49-4.31)	4.00 (3.50-4.60)	7.80 (6.60-8.90)	13.5 (11.7-15.1)	18.8 (16.3-23.5)	971
Asians (2011 - 2012)	4.39 (3.63-5.31)	4.20 (3.30-5.20)	9.40 (7.20-11.3)	19.0 (15.0-27.8)	36.8 (25.4-52.4)	352
Asians (2013 - 2014)	3.25 (2.81-3.76)	3.20 (2.60-4.10)	6.20 (5.10-7.30)	11.0 (9.50-13.7)	16.1 (11.7-23.3)	289
Asians (2015 - 2016)	3.70 (3.21-4.27)	4.10 (3.20-4.60)	8.60 (6.50-10.0)	17.8 (12.5-22.0)	29.6 (17.0-56.9)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.2, 0.2, and 0.2, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP) (creatinine corrected) (2001 – 2010)

CAS Number 40321-98-0

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	12.6 (11.5-13.9)	11.2 (10.2-12.3)	21.3 (18.3-23.8)	45.2 (37.1-58.1)	87.0 (68.0-124)	2782
Total population (2003 - 2004)	13.6 (12.4-14.8)	12.1 (11.0-12.9)	24.3 (20.9-27.8)	63.0 (47.8-75.8)	118 (94.1-153)	2605
Total population (2005 - 2006)	15.8 (14.2-17.5)	13.5 (12.4-14.7)	28.9 (26.0-33.8)	77.7 (62.4-91.1)	144 (118-172)	2548
Total population (2007 - 2008)	12.3 (10.7-14.0)	11.0 (9.72-12.2)	22.3 (18.4-27.9)	52.9 (37.9-74.6)	107 (74.8-136)	2604
Total population (2009 - 2010)	8.37 (7.31-9.59)	7.44 (6.71-8.42)	13.5 (11.5-15.7)	25.9 (21.4-34.6)	47.7 (34.6-67.8)	2749
Age 6-11 years (2001 - 2002)	26.6 (24.0-29.4)	22.8 (20.3-25.0)	43.3 (33.6-47.1)	74.7 (69.0-91.9)	131 (83.0-183)	393
Age 6-11 years (2003 - 2004)	26.6 (21.4-33.0)	25.3 (17.8-32.4)	43.6 (34.2-63.2)	77.1 (63.0-118)	121 (76.3-435)	342
Age 6-11 years (2005 - 2006)	25.4 (22.5-28.6)	24.4 (21.4-26.4)	42.7 (36.0-46.9)	70.4 (52.8-117)	136 (77.2-195)	356
Age 6-11 years (2007 - 2008)	20.8 (17.1-25.4)	18.5 (15.6-21.5)	35.0 (26.4-46.0)	84.1 (47.2-137)	145 (84.8-187)	389
Age 6-11 years (2009 - 2010)	12.7 (11.4-14.2)	12.6 (11.5-14.1)	20.8 (16.5-25.1)	33.3 (29.5-44.1)	45.5 (33.7-74.5)	415
Age 12-19 years (2001 - 2002)	13.5 (12.0-15.2)	12.0 (10.8-14.3)	23.4 (20.0-28.5)	48.4 (39.2-54.9)	70.5 (55.0-97.2)	742
Age 12-19 years (2003 - 2004)	14.6 (12.6-16.9)	12.7 (11.6-14.4)	25.5 (20.7-33.8)	67.9 (42.3-143)	153 (61.8-209)	729
Age 12-19 years (2005 - 2006)	17.2 (14.1-20.9)	15.3 (12.5-18.6)	32.5 (25.7-41.3)	84.2 (49.1-147)	163 (93.1-250)	702
Age 12-19 years (2007 - 2008)	13.2 (10.3-16.7)	11.1 (9.08-13.5)	25.9 (18.9-35.6)	86.3 (39.4-128)	132 (84.3-203)	401
Age 12-19 years (2009 - 2010)	8.06 (6.57-9.88)	7.05 (6.16-8.25)	13.3 (9.53-18.3)	24.8 (17.8-47.9)	55.2 (23.6-110)	420
Age 20+ years (2001 - 2002)	11.4 (10.2-12.8)	10.1 (8.89-11.4)	17.5 (15.2-21.8)	38.4 (30.5-52.5)	84.3 (53.3-128)	1647
Age 20+ years (2003 - 2004)	12.4 (11.5-13.3)	11.0 (10.0-12.0)	20.9 (18.6-22.8)	53.9 (40.7-70.2)	109 (88.6-130)	1534
Age 20+ years (2005 - 2006)	14.8 (13.3-16.4)	12.4 (11.2-13.5)	26.7 (23.8-31.3)	76.3 (61.0-89.9)	144 (106-170)	1490
Age 20+ years (2007 - 2008)	11.4 (10.0-13.0)	10.0 (9.15-11.2)	20.8 (16.7-25.6)	47.3 (33.2-65.3)	87.4 (62.7-136)	1814
Age 20+ years (2009 - 2010)	8.04 (6.99-9.24)	7.19 (6.36-8.00)	12.7 (10.7-14.7)	24.3 (19.7-34.6)	47.4 (33.7-67.3)	1914
Males (2001 - 2002)	11.8 (10.7-13.0)	10.2 (8.93-11.7)	21.2 (18.5-23.3)	46.1 (35.3-58.7)	84.2 (69.6-104)	1371
Males (2003 - 2004)	12.3 (11.1-13.5)	11.1 (10.0-12.0)	21.6 (17.6-26.9)	59.1 (45.4-72.0)	120 (72.0-162)	1250
Males (2005 - 2006)	14.7 (12.9-16.7)	12.6 (10.9-14.3)	27.1 (23.3-35.6)	79.5 (59.6-96.9)	147 (120-190)	1270
Males (2007 - 2008)	10.5 (9.08-12.2)	9.25 (8.08-10.6)	18.9 (15.9-23.1)	46.7 (32.6-62.4)	86.4 (56.5-144)	1294
Males (2009 - 2010)	8.19 (7.15-9.38)	7.07 (6.59-7.55)	13.4 (10.8-15.8)	30.2 (21.7-41.2)	52.1 (41.2-82.3)	1399
Females (2001 - 2002)	13.5 (11.9-15.2)	12.0 (10.8-13.7)	21.5 (18.0-25.6)	44.8 (36.8-61.6)	92.3 (61.0-139)	1411
Females (2003 - 2004)	14.9 (13.4-16.7)	12.7 (11.4-14.2)	26.6 (21.8-30.6)	65.6 (48.0-90.1)	118 (97.0-157)	1355
Females (2005 - 2006)	16.9 (15.1-19.0)	14.7 (13.2-16.5)	30.3 (26.6-34.7)	76.4 (57.6-97.2)	137 (106-170)	1278
Females (2007 - 2008)	14.2 (12.5-16.0)	12.5 (11.5-13.8)	25.9 (21.2-31.0)	61.1 (40.9-84.1)	114 (84.3-142)	1310
Females (2009 - 2010)	8.55 (7.37-9.93)	8.06 (6.76-9.33)	13.6 (11.6-16.2)	24.1 (20.0-32.7)	43.2 (27.7-64.5)	1350

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP) (creatinine corrected) (2001 – 2010)

CAS Number 40321-98-0

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	12.4 (11.4-13.5)	11.0 (10.5-12.3)	20.9 (18.5-24.4)	44.6 (33.4-56.2)	65.9 (53.1-83.1)	677
Mexican Americans (2003 - 2004)	11.5 (9.81-13.6)	10.7 (9.04-12.3)	18.8 (15.6-24.6)	39.1 (31.8-53.9)	63.0 (47.2-121)	652
Mexican Americans (2005 - 2006)	13.3 (11.1-16.1)	11.4 (9.58-13.6)	24.0 (19.4-30.4)	61.2 (45.6-85.9)	102 (69.9-200)	637
Mexican Americans (2007 - 2008)	12.3 (10.0-15.0)	10.6 (8.57-14.1)	21.7 (16.1-28.7)	53.1 (32.7-85.2)	113 (79.7-149)	531
Mexican Americans (2009 - 2010)	9.50 (8.16-11.1)	8.72 (8.13-9.61)	16.6 (12.9-20.5)	35.4 (24.4-46.6)	56.7 (40.9-82.3)	566
Non-Hispanic blacks (2001 - 2002)	13.8 (12.3-15.4)	13.1 (12.0-14.2)	23.9 (20.0-29.3)	58.3 (45.3-79.7)	101 (81.3-124)	703
Non-Hispanic blacks (2003 - 2004)	14.3 (13.1-15.6)	13.3 (11.3-15.5)	24.8 (21.7-27.7)	61.2 (46.8-76.6)	105 (79.7-152)	699
Non-Hispanic blacks (2005 - 2006)	15.3 (13.2-17.8)	11.6 (9.87-14.6)	29.1 (24.7-38.5)	77.1 (61.9-113)	172 (99.8-251)	678
Non-Hispanic blacks (2007 - 2008)	11.0 (9.94-12.2)	9.90 (9.16-11.1)	20.6 (16.6-23.5)	42.2 (33.8-58.6)	75.8 (57.2-124)	597
Non-Hispanic blacks (2009 - 2010)	6.92 (5.60-8.57)	6.49 (5.12-8.24)	11.4 (9.09-14.1)	19.2 (14.9-27.3)	28.1 (19.8-61.1)	516
Non-Hispanic whites (2001 - 2002)	12.7 (11.4-14.0)	11.1 (9.90-12.3)	20.8 (18.0-23.9)	45.7 (35.9-64.9)	96.0 (68.5-161)	1216
Non-Hispanic whites (2003 - 2004)	13.7 (12.2-15.3)	12.0 (10.5-12.9)	24.9 (20.7-28.6)	69.5 (51.4-95.3)	124 (90.3-182)	1088
Non-Hispanic whites (2005 - 2006)	16.3 (14.8-18.0)	14.0 (12.9-15.7)	30.8 (27.3-34.8)	79.3 (66.0-93.8)	139 (117-163)	1038
Non-Hispanic whites (2007 - 2008)	12.2 (10.3-14.5)	11.0 (9.38-13.1)	22.3 (17.4-30.4)	51.4 (35.7-77.7)	107 (74.6-139)	1077
Non-Hispanic whites (2009 - 2010)	8.53 (7.35-9.90)	7.62 (6.76-8.54)	13.7 (11.2-16.2)	24.9 (20.3-35.7)	47.8 (32.8-76.4)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP) (creatinine corrected) (2011 – 2016)

CAS Number 40321-98-0

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	5.78 (5.51-6.06)	5.51 (5.12-5.83)	8.99 (8.41-9.83)	15.6 (14.3-16.8)	23.4 (19.6-28.0)	2487
Total population (2013 - 2014)	4.25 (3.92-4.61)	4.02 (3.74-4.43)	6.61 (5.93-7.26)	11.1 (9.73-12.7)	16.4 (13.9-18.1)	2684
Total population (2015 - 2016)	3.70 (3.49-3.92)	3.47 (3.27-3.75)	5.90 (5.52-6.24)	10.6 (9.71-11.9)	16.9 (14.7-18.4)	2974
Age 3-5 years (2015 - 2016)	13.9 (12.9-14.8)	13.6 (12.2-15.0)	23.0 (20.5-25.2)	35.5 (30.6-40.8)	47.8 (40.8-54.3)	464
Age 6-11 years (2011 - 2012)	9.93 (8.63-11.4)	9.89 (8.25-11.4)	16.5 (14.3-18.9)	25.6 (22.9-30.2)	34.5 (27.9-41.9)	395
Age 6-11 years (2013 - 2014)	8.23 (7.16-9.44)	7.77 (6.25-9.38)	12.8 (10.7-17.1)	24.7 (17.9-37.1)	37.4 (21.4-80.7)	409
Age 6-11 years (2015 - 2016)	7.70 (7.12-8.32)	7.26 (6.63-8.04)	11.2 (10.0-13.0)	19.4 (14.6-22.9)	23.9 (20.6-30.3)	415
Age 12-19 years (2011 - 2012)	5.55 (4.95-6.23)	5.21 (4.81-5.61)	8.54 (7.09-11.1)	16.3 (12.9-21.3)	31.6 (16.8-35.3)	388
Age 12-19 years (2013 - 2014)	4.33 (3.82-4.92)	4.07 (3.71-4.69)	6.55 (5.64-7.19)	10.7 (8.02-13.4)	15.3 (11.5-18.6)	462
Age 12-19 years (2015 - 2016)	2.92 (2.66-3.20)	2.81 (2.50-3.07)	4.49 (3.72-5.22)	7.04 (5.50-8.67)	9.31 (7.26-10.7)	405
Age 20+ years (2011 - 2012)	5.48 (5.23-5.74)	5.19 (4.89-5.56)	8.39 (7.95-8.98)	13.9 (12.8-15.3)	19.3 (16.6-25.4)	1704
Age 20+ years (2013 - 2014)	3.95 (3.63-4.30)	3.85 (3.54-4.15)	6.15 (5.48-6.75)	9.83 (8.57-11.1)	13.6 (12.2-16.3)	1813
Age 20+ years (2015 - 2016)	3.36 (3.15-3.57)	3.26 (3.00-3.46)	5.27 (4.80-5.66)	8.64 (7.27-9.88)	13.0 (10.6-15.7)	1690
Males (2011 - 2012)	5.14 (4.86-5.43)	4.86 (4.55-5.12)	7.83 (7.29-8.24)	14.7 (12.7-16.1)	22.6 (18.1-29.7)	1258
Males (2013 - 2014)	3.74 (3.45-4.06)	3.70 (3.46-3.91)	5.59 (5.13-6.37)	9.03 (8.37-9.74)	14.3 (11.6-16.8)	1284
Males (2015 - 2016)	3.34 (3.03-3.67)	3.18 (2.87-3.46)	5.41 (4.74-6.00)	9.81 (8.57-11.7)	14.8 (12.8-18.8)	1474
Females (2011 - 2012)	6.48 (6.07-6.91)	6.34 (5.71-6.91)	10.0 (9.34-11.0)	16.5 (14.7-18.6)	23.5 (19.5-27.9)	1229
Females (2013 - 2014)	4.81 (4.31-5.37)	4.58 (4.00-5.16)	7.42 (6.58-8.62)	12.6 (10.7-15.6)	17.2 (14.8-21.3)	1400
Females (2015 - 2016)	4.08 (3.85-4.34)	3.84 (3.64-4.05)	6.27 (5.87-6.82)	11.2 (10.0-13.1)	17.6 (15.0-19.6)	1500
Mexican Americans (2011 - 2012)	6.61 (5.43-8.05)	6.00 (4.83-7.45)	11.3 (8.87-13.9)	18.9 (15.8-22.8)	28.1 (18.2-60.8)	316
Mexican Americans (2013 - 2014)	5.13 (4.57-5.75)	4.90 (4.42-5.49)	8.51 (6.80-10.7)	14.3 (12.0-19.5)	20.7 (15.6-31.7)	438
Mexican Americans (2015 - 2016)	4.32 (3.95-4.71)	4.34 (3.81-4.74)	7.35 (6.51-8.00)	12.3 (10.5-16.8)	19.7 (15.0-27.3)	595
Non-Hispanic blacks (2011 - 2012)	5.68 (5.11-6.32)	5.31 (4.71-5.70)	9.33 (7.79-10.8)	16.9 (13.6-23.4)	29.4 (18.8-39.2)	665
Non-Hispanic blacks (2013 - 2014)	3.97 (3.55-4.44)	3.79 (3.28-4.42)	6.43 (5.67-7.31)	10.6 (9.55-12.2)	14.1 (11.2-18.6)	609
Non-Hispanic blacks (2015 - 2016)	3.66 (3.31-4.03)	3.33 (3.04-3.74)	6.33 (5.27-7.50)	12.0 (10.8-14.0)	19.8 (14.7-23.8)	697
Non-Hispanic whites (2011 - 2012)	5.61 (5.17-6.08)	5.41 (4.90-5.99)	8.42 (7.84-9.61)	14.3 (12.5-15.8)	20.5 (16.6-25.4)	811
Non-Hispanic whites (2013 - 2014)	4.16 (3.75-4.62)	3.96 (3.70-4.41)	6.37 (5.47-7.23)	10.3 (8.57-12.7)	15.6 (12.8-17.3)	987
Non-Hispanic whites (2015 - 2016)	3.54 (3.26-3.86)	3.36 (3.10-3.64)	5.49 (5.07-5.98)	9.27 (7.33-12.5)	14.6 (12.5-18.3)	862
All Hispanics (2011 - 2012)	6.66 (6.05-7.33)	6.04 (5.49-6.74)	11.3 (10.0-13.5)	18.9 (16.9-21.0)	30.2 (20.8-41.9)	571
All Hispanics (2013 - 2014)	4.91 (4.55-5.31)	4.60 (4.26-5.07)	7.76 (6.94-9.27)	13.6 (11.5-17.0)	20.2 (16.9-25.2)	690
All Hispanics (2015 - 2016)	4.09 (3.80-4.39)	4.00 (3.68-4.29)	6.78 (6.36-7.27)	11.6 (10.5-12.9)	18.6 (14.9-22.0)	971
Asians (2011 - 2012)	5.88 (4.96-6.97)	5.30 (4.59-6.36)	10.0 (8.11-12.2)	20.2 (14.7-26.3)	39.3 (23.5-50.1)	352
Asians (2013 - 2014)	4.12 (3.68-4.62)	3.67 (3.20-4.49)	7.02 (5.79-8.62)	11.2 (10.0-13.9)	15.7 (12.1-24.4)	288
Asians (2015 - 2016)	4.59 (3.93-5.35)	4.04 (3.53-4.78)	7.73 (6.67-10.5)	20.0 (11.4-25.5)	27.7 (20.0-45.0)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP) (2003 – 2010)

CAS Number 40809-41-4

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	34.7 (31.0-38.9)	33.0 (29.1-37.4)	71.8 (61.7-84.8)	168 (133-240)	339 (235-506)	2605
Total population (2005 - 2006)	38.6 (34.7-42.9)	35.6 (31.1-40.3)	79.7 (70.9-92.9)	211 (180-246)	386 (311-484)	2548
Total population (2007 - 2008)	33.3 (28.7-38.6)	31.2 (27.1-36.0)	69.5 (55.8-86.3)	153 (120-216)	308 (220-397)	2604
Total population (2009 - 2010)	20.7 (18.5-23.3)	20.4 (18.1-23.5)	39.9 (34.9-45.5)	78.4 (67.2-95.5)	127 (99.5-199)	2749
Age 6-11 years (2003 - 2004)	58.2 (44.7-75.6)	51.6 (39.2-67.6)	112 (71.4-182)	314 (124-524)	391 (238-781)	342
Age 6-11 years (2005 - 2006)	57.4 (50.2-65.7)	53.5 (42.7-67.2)	94.7 (83.2-108)	200 (154-247)	297 (196-548)	356
Age 6-11 years (2007 - 2008)	46.6 (39.2-55.3)	44.1 (34.9-54.7)	92.7 (64.7-112)	156 (117-278)	357 (176-441)	389
Age 6-11 years (2009 - 2010)	27.7 (24.7-31.2)	29.4 (25.4-33.2)	48.5 (39.0-60.2)	87.1 (64.4-102)	118 (87.1-202)	415
Age 12-19 years (2003 - 2004)	44.6 (36.8-54.0)	42.7 (38.4-47.6)	86.5 (67.3-108)	220 (120-397)	448 (235-808)	729
Age 12-19 years (2005 - 2006)	52.9 (43.0-65.2)	46.7 (39.4-61.6)	114 (85.6-173)	314 (195-515)	560 (324-1180)	702
Age 12-19 years (2007 - 2008)	44.3 (35.2-55.9)	38.9 (28.9-49.3)	97.3 (64.3-127)	247 (140-456)	476 (231-977)	401
Age 12-19 years (2009 - 2010)	26.2 (22.4-30.6)	25.7 (21.2-30.0)	50.1 (38.3-57.7)	90.3 (58.2-162)	147 (83.9-349)	420
Age 20+ years (2003 - 2004)	31.3 (28.6-34.4)	29.2 (26.2-33.0)	63.5 (56.5-73.9)	157 (130-187)	312 (199-457)	1534
Age 20+ years (2005 - 2006)	35.1 (31.5-39.0)	31.3 (28.1-35.7)	72.7 (65.4-82.4)	193 (163-237)	377 (285-460)	1490
Age 20+ years (2007 - 2008)	30.7 (26.4-35.8)	29.2 (24.3-34.4)	63.2 (51.6-80.0)	145 (109-206)	286 (182-378)	1814
Age 20+ years (2009 - 2010)	19.4 (17.0-22.0)	18.8 (15.7-22.3)	37.7 (32.8-44.0)	76.9 (63.1-92.8)	126 (96.1-197)	1914
Males (2003 - 2004)	37.9 (33.1-43.5)	34.7 (30.0-39.5)	73.7 (60.8-91.9)	187 (133-300)	388 (222-660)	1250
Males (2005 - 2006)	43.6 (38.1-49.8)	39.7 (31.9-46.2)	87.0 (76.8-103)	260 (188-308)	460 (347-670)	1270
Males (2007 - 2008)	34.4 (29.3-40.5)	31.5 (27.3-35.7)	65.1 (52.1-87.4)	161 (120-217)	321 (213-422)	1294
Males (2009 - 2010)	23.4 (20.7-26.4)	23.0 (20.2-25.6)	44.9 (40.1-51.0)	87.1 (70.3-110)	162 (107-288)	1399
Females (2003 - 2004)	31.9 (28.1-36.2)	31.3 (27.5-35.8)	69.3 (58.9-81.9)	154 (128-199)	312 (182-441)	1355
Females (2005 - 2006)	34.3 (30.4-38.6)	31.7 (28.0-36.6)	71.0 (63.0-85.3)	192 (156-217)	309 (251-386)	1278
Females (2007 - 2008)	32.3 (27.8-37.5)	31.0 (26.4-38.3)	73.0 (56.9-90.2)	147 (112-220)	297 (185-420)	1310
Females (2009 - 2010)	18.5 (16.2-21.0)	18.8 (15.8-22.4)	34.7 (29.3-41.5)	72.9 (56.3-93.2)	111 (90.3-146)	1350
Mexican Americans (2003 - 2004)	31.9 (27.1-37.6)	31.5 (26.8-37.4)	57.4 (45.9-71.8)	116 (86.0-162)	175 (133-355)	652
Mexican Americans (2005 - 2006)	39.4 (30.3-51.2)	34.2 (24.1-47.1)	74.6 (54.0-111)	220 (124-338)	394 (222-673)	637
Mexican Americans (2007 - 2008)	36.7 (30.6-44.0)	31.3 (27.0-35.7)	71.9 (54.9-91.7)	162 (123-241)	321 (209-477)	531
Mexican Americans (2009 - 2010)	26.2 (22.5-30.4)	25.8 (22.3-29.8)	51.0 (41.3-57.4)	92.6 (74.5-122)	160 (113-245)	566
Non-Hispanic blacks (2003 - 2004)	42.6 (37.0-49.2)	38.3 (33.8-46.9)	82.5 (68.7-103)	191 (146-246)	339 (244-468)	699
Non-Hispanic blacks (2005 - 2006)	46.6 (41.3-52.5)	40.3 (35.6-46.1)	96.3 (76.6-132)	256 (208-347)	455 (328-528)	678
Non-Hispanic blacks (2007 - 2008)	35.0 (31.1-39.4)	35.6 (30.7-38.8)	71.6 (59.1-84.5)	151 (113-192)	235 (184-338)	597
Non-Hispanic blacks (2009 - 2010)	21.9 (18.6-25.7)	22.3 (18.2-25.6)	40.5 (35.7-47.1)	77.0 (61.1-97.1)	127 (76.0-268)	516
Non-Hispanic whites (2003 - 2004)	33.8 (30.1-37.9)	32.1 (27.6-37.5)	72.4 (62.0-87.7)	167 (133-240)	354 (220-560)	1088
Non-Hispanic whites (2005 - 2006)	37.0 (33.4-41.0)	35.4 (30.4-40.9)	79.7 (70.0-93.3)	203 (174-237)	380 (284-484)	1038
Non-Hispanic whites (2007 - 2008)	32.0 (26.7-38.3)	30.4 (24.5-38.0)	67.6 (52.5-90.9)	145 (105-244)	316 (197-476)	1077
Non-Hispanic whites (2009 - 2010)	19.6 (17.2-22.2)	19.3 (16.4-23.1)	39.3 (33.0-45.3)	75.0 (61.9-95.7)	120 (95.5-197)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.3, 0.6, 0.5, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP) (2011 – 2016)

CAS Number 40809-41-4

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	12.9 (12.0-13.9)	13.5 (12.4-14.8)	25.3 (23.6-26.7)	43.9 (40.0-51.1)	68.9 (60.4-75.2)	2489
Total population (2013 - 2014)	10.5 (9.71-11.5)	11.1 (10.1-12.0)	20.0 (17.9-22.5)	36.4 (31.4-42.0)	50.7 (46.5-58.7)	2685
Total population (2015 - 2016)	8.83 (8.10-9.64)	9.00 (8.30-10.0)	17.1 (15.2-19.0)	29.2 (25.3-33.1)	46.2 (37.1-50.6)	2975
Age 3-5 years (2015 - 2016)	14.9 (13.5-16.6)	14.4 (12.4-15.9)	29.5 (24.3-32.6)	56.1 (44.0-65.0)	74.8 (64.3-88.1)	465
Age 6-11 years (2011 - 2012)	18.8 (16.1-21.9)	21.6 (17.3-24.1)	36.8 (31.5-41.4)	63.5 (51.5-71.5)	81.5 (68.1-95.1)	396
Age 6-11 years (2013 - 2014)	18.2 (15.5-21.4)	18.1 (14.2-23.4)	33.9 (28.3-39.6)	54.3 (45.5-71.8)	81.1 (58.5-142)	409
Age 6-11 years (2015 - 2016)	14.6 (12.9-16.6)	14.9 (13.3-16.7)	24.5 (21.5-28.5)	42.5 (35.3-54.8)	60.3 (54.2-75.0)	415
Age 12-19 years (2011 - 2012)	14.3 (11.3-18.0)	14.0 (11.6-17.5)	28.4 (23.5-36.8)	59.3 (47.1-70.2)	74.6 (59.3-135)	388
Age 12-19 years (2013 - 2014)	13.6 (11.8-15.7)	13.8 (11.2-16.2)	25.7 (20.0-29.9)	44.4 (31.2-64.6)	64.9 (48.6-99.5)	462
Age 12-19 years (2015 - 2016)	9.38 (7.97-11.0)	9.60 (8.30-11.8)	16.5 (14.2-19.5)	24.6 (20.9-36.9)	41.4 (25.8-49.7)	405
Age 20+ years (2011 - 2012)	12.2 (11.3-13.3)	13.0 (11.4-14.4)	23.8 (21.8-25.8)	40.2 (36.9-43.9)	61.8 (52.1-73.6)	1705
Age 20+ years (2013 - 2014)	9.57 (8.84-10.4)	10.1 (9.10-11.3)	18.3 (16.6-19.8)	32.1 (27.5-37.8)	46.4 (39.5-51.8)	1814
Age 20+ years (2015 - 2016)	8.12 (7.42-8.88)	8.30 (7.60-8.90)	16.0 (14.0-17.9)	26.3 (23.5-31.7)	42.7 (32.3-50.2)	1690
Males (2011 - 2012)	14.3 (13.0-15.6)	14.6 (12.7-16.4)	24.7 (23.1-27.6)	45.7 (40.2-54.9)	71.5 (59.8-88.4)	1259
Males (2013 - 2014)	11.1 (9.98-12.3)	11.6 (10.6-12.5)	19.3 (17.1-22.3)	35.1 (29.3-44.0)	50.7 (47.4-58.4)	1285
Males (2015 - 2016)	9.36 (8.42-10.4)	9.60 (8.40-11.0)	17.8 (15.9-20.6)	31.0 (25.8-35.0)	47.6 (34.2-54.7)	1474
Females (2011 - 2012)	11.8 (10.8-12.9)	12.4 (11.2-13.7)	25.6 (23.4-26.6)	42.3 (37.4-49.5)	64.9 (54.4-76.8)	1230
Females (2013 - 2014)	10.1 (9.05-11.2)	10.2 (8.90-11.7)	20.6 (18.4-23.2)	36.9 (31.5-41.8)	51.7 (41.3-64.9)	1400
Females (2015 - 2016)	8.35 (7.62-9.15)	8.40 (7.70-9.30)	16.4 (14.1-18.6)	27.8 (22.1-33.7)	42.4 (34.6-49.7)	1501
Mexican Americans (2011 - 2012)	15.8 (12.7-19.6)	14.9 (12.7-18.3)	28.1 (22.6-34.3)	51.3 (42.5-71.3)	72.6 (56.6-109)	316
Mexican Americans (2013 - 2014)	13.4 (11.0-16.2)	13.1 (12.1-14.2)	23.4 (18.0-30.2)	44.4 (31.8-67.9)	67.9 (42.0-95.0)	438
Mexican Americans (2015 - 2016)	10.4 (9.29-11.7)	10.3 (8.80-11.8)	20.1 (16.6-23.1)	32.8 (26.1-42.5)	53.2 (35.5-76.4)	595
Non-Hispanic blacks (2011 - 2012)	16.4 (14.5-18.5)	16.2 (14.4-18.8)	30.7 (26.0-36.6)	60.9 (47.5-69.9)	78.1 (68.2-96.7)	665
Non-Hispanic blacks (2013 - 2014)	11.5 (9.62-13.8)	12.7 (10.4-14.6)	21.5 (18.5-25.6)	36.4 (30.4-48.6)	58.5 (42.1-71.8)	609
Non-Hispanic blacks (2015 - 2016)	10.7 (8.95-12.7)	10.4 (9.20-12.0)	19.5 (16.5-23.2)	37.4 (27.7-47.1)	58.9 (44.0-79.6)	698
Non-Hispanic whites (2011 - 2012)	11.8 (10.9-12.9)	12.5 (11.0-14.6)	23.8 (21.8-25.7)	39.9 (34.8-44.2)	55.8 (47.1-76.8)	813
Non-Hispanic whites (2013 - 2014)	9.81 (8.92-10.8)	10.3 (9.20-11.4)	19.3 (16.5-22.0)	34.1 (28.7-41.0)	49.1 (43.1-54.8)	987
Non-Hispanic whites (2015 - 2016)	8.07 (7.20-9.04)	8.40 (7.40-9.40)	15.5 (14.0-17.9)	25.7 (21.6-31.4)	39.3 (31.0-47.9)	862
All Hispanics (2011 - 2012)	16.0 (14.0-18.2)	15.2 (12.9-18.2)	30.1 (24.5-37.8)	59.8 (50.0-68.9)	76.0 (70.2-104)	571
All Hispanics (2013 - 2014)	13.1 (11.7-14.7)	13.4 (12.3-14.4)	23.1 (20.6-26.5)	41.6 (35.1-54.1)	63.5 (45.5-75.4)	690
All Hispanics (2015 - 2016)	10.2 (9.16-11.3)	10.1 (9.10-11.5)	20.0 (16.9-22.1)	33.1 (29.3-37.4)	48.8 (38.8-59.4)	971
Asians (2011 - 2012)	12.0 (10.2-14.2)	11.7 (10.2-13.7)	23.6 (19.5-27.7)	51.1 (36.5-70.0)	80.5 (58.7-138)	352
Asians (2013 - 2014)	9.01 (7.74-10.5)	9.20 (7.20-11.1)	16.5 (14.3-18.5)	27.3 (22.9-31.4)	39.4 (29.4-63.2)	289
Asians (2015 - 2016)	9.47 (8.10-11.1)	9.90 (8.10-11.5)	19.4 (16.8-22.7)	41.2 (27.5-48.5)	58.3 (41.2-112)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.2, 0.4, and 0.4, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP) (creatinine corrected) (2003 – 2010)

CAS Number 40809-41-4

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	32.6 (29.6-36.0)	27.0 (24.3-30.6)	54.6 (48.0-63.5)	139 (109-186)	251 (192-356)	2605
Total population (2005 - 2006)	37.6 (33.7-42.0)	32.2 (29.5-37.0)	67.5 (58.2-80.8)	168 (139-209)	290 (261-328)	2548
Total population (2007 - 2008)	33.6 (29.7-38.0)	29.1 (25.8-32.2)	58.7 (49.6-68.8)	138 (109-164)	233 (178-319)	2604
Total population (2009 - 2010)	21.6 (19.0-24.7)	19.2 (16.8-22.1)	33.7 (30.0-40.0)	69.4 (54.0-84.3)	121 (85.1-184)	2749
Age 6-11 years (2003 - 2004)	61.5 (49.0-77.2)	52.2 (41.6-73.8)	104 (74.2-140)	210 (111-500)	372 (192-988)	342
Age 6-11 years (2005 - 2006)	63.2 (55.6-71.9)	54.2 (48.1-63.6)	92.8 (82.6-111)	160 (124-247)	312 (172-480)	356
Age 6-11 years (2007 - 2008)	57.4 (49.2-66.9)	49.6 (42.7-61.5)	94.2 (79.5-122)	185 (138-294)	376 (188-404)	389
Age 6-11 years (2009 - 2010)	36.1 (32.4-40.3)	33.6 (32.3-36.8)	55.4 (43.9-66.9)	88.7 (69.2-113)	121 (90.6-224)	415
Age 12-19 years (2003 - 2004)	33.4 (28.7-38.7)	27.1 (23.9-32.0)	55.0 (43.8-83.8)	168 (92.5-289)	294 (159-387)	729
Age 12-19 years (2005 - 2006)	39.5 (32.5-47.8)	33.9 (27.9-41.0)	72.7 (56.9-96.7)	197 (106-327)	385 (216-531)	702
Age 12-19 years (2007 - 2008)	34.5 (28.1-42.3)	28.0 (23.2-35.0)	65.9 (47.5-85.9)	159 (90.1-233)	246 (159-489)	401
Age 12-19 years (2009 - 2010)	21.1 (17.4-25.5)	18.2 (15.6-20.7)	33.2 (25.5-43.3)	64.9 (42.7-158)	158 (58.4-246)	420
Age 20+ years (2003 - 2004)	30.1 (27.7-32.7)	25.1 (22.9-27.6)	49.1 (44.1-55.2)	126 (101-154)	237 (191-315)	1534
Age 20+ years (2005 - 2006)	35.2 (31.2-39.6)	29.8 (26.1-33.3)	60.8 (54.2-74.0)	167 (131-206)	279 (247-322)	1490
Age 20+ years (2007 - 2008)	31.5 (27.8-35.8)	27.8 (24.1-30.8)	53.1 (45.0-65.4)	128 (101-155)	214 (162-319)	1814
Age 20+ years (2009 - 2010)	20.5 (17.9-23.5)	18.2 (15.9-20.5)	31.7 (27.4-36.8)	65.0 (52.1-80.6)	118 (81.3-173)	1914
Males (2003 - 2004)	29.8 (26.8-33.1)	23.5 (21.4-27.1)	50.7 (42.2-61.7)	132 (98.0-191)	248 (159-422)	1250
Males (2005 - 2006)	35.0 (30.7-39.9)	29.0 (25.7-32.1)	69.3 (54.2-82.9)	172 (141-210)	301 (249-376)	1270
Males (2007 - 2008)	29.0 (25.3-33.2)	25.1 (21.7-28.8)	47.6 (40.8-57.4)	120 (91.7-157)	210 (157-331)	1294
Males (2009 - 2010)	21.0 (18.4-23.9)	18.4 (16.1-20.4)	33.1 (29.2-38.5)	70.2 (53.4-94.6)	125 (92.8-210)	1399
Females (2003 - 2004)	35.5 (31.6-40.0)	30.6 (26.4-35.5)	58.3 (48.8-71.8)	144 (108-192)	251 (192-349)	1355
Females (2005 - 2006)	40.3 (36.2-44.9)	36.7 (31.6-40.0)	66.1 (58.2-83.7)	168 (127-206)	279 (240-341)	1278
Females (2007 - 2008)	38.7 (34.5-43.3)	32.8 (30.0-36.4)	67.8 (58.5-80.0)	147 (117-176)	266 (176-379)	1310
Females (2009 - 2010)	22.3 (19.3-25.7)	20.5 (17.2-23.9)	34.9 (30.0-41.7)	67.0 (53.5-80.8)	104 (80.8-170)	1350
Mexican Americans (2003 - 2004)	28.8 (25.4-32.6)	24.7 (22.4-26.3)	46.7 (39.0-56.3)	94.7 (73.2-137)	152 (118-238)	652
Mexican Americans (2005 - 2006)	35.5 (28.7-43.7)	29.8 (25.5-34.9)	61.5 (48.4-86.2)	165 (105-201)	278 (181-501)	637
Mexican Americans (2007 - 2008)	35.8 (29.1-44.0)	30.6 (23.2-38.6)	64.1 (47.2-84.8)	151 (92.3-240)	286 (198-402)	531
Mexican Americans (2009 - 2010)	26.0 (22.5-30.0)	23.8 (21.3-27.0)	40.1 (35.0-52.3)	88.8 (69.5-104)	148 (100-203)	566
Non-Hispanic blacks (2003 - 2004)	30.3 (27.7-33.2)	27.0 (23.2-30.7)	51.1 (41.6-64.0)	135 (100-161)	212 (173-252)	699
Non-Hispanic blacks (2005 - 2006)	32.7 (28.9-37.1)	27.1 (22.4-31.5)	62.4 (53.1-76.0)	166 (119-260)	370 (231-429)	678
Non-Hispanic blacks (2007 - 2008)	27.2 (24.3-30.5)	23.5 (21.9-26.1)	49.1 (37.7-58.6)	103 (85.9-132)	178 (140-259)	597
Non-Hispanic blacks (2009 - 2010)	15.9 (12.6-19.9)	14.5 (11.5-18.8)	26.3 (19.5-32.9)	48.0 (32.6-66.4)	70.7 (46.1-209)	516
Non-Hispanic whites (2003 - 2004)	33.4 (29.5-37.7)	27.0 (23.5-31.6)	56.8 (48.6-69.4)	145 (109-198)	294 (193-385)	1088
Non-Hispanic whites (2005 - 2006)	39.0 (34.9-43.4)	34.3 (30.3-39.1)	69.5 (59.5-83.7)	182 (143-214)	284 (237-324)	1038
Non-Hispanic whites (2007 - 2008)	33.4 (28.4-39.3)	29.2 (25.1-34.6)	57.7 (46.6-72.4)	138 (101-166)	233 (164-338)	1077
Non-Hispanic whites (2009 - 2010)	22.0 (19.1-25.3)	19.4 (16.8-22.9)	34.0 (29.3-42.5)	67.6 (52.5-84.3)	113 (81.3-188)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP) (creatinine corrected) (2011 – 2016)

CAS Number 40809-41-4

Metabolite of Di-2-ethylhexyl phthalate (DEHP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	14.7 (13.8-15.7)	14.1 (12.9-15.1)	22.7 (21.1-25.3)	38.9 (34.5-44.3)	59.8 (54.5-63.5)	2487
Total population (2013 - 2014)	10.6 (9.68-11.6)	10.2 (9.32-11.0)	16.2 (14.5-18.2)	28.5 (25.3-32.0)	40.3 (35.2-46.0)	2684
Total population (2015 - 2016)	9.14 (8.58-9.74)	8.50 (7.86-9.23)	14.0 (13.2-15.1)	24.3 (22.6-26.9)	39.1 (35.6-45.2)	2974
Age 3-5 years (2015 - 2016)	35.7 (32.9-38.7)	35.0 (30.8-39.2)	57.5 (50.2-64.1)	94.0 (78.2-111)	122 (98.0-152)	464
Age 6-11 years (2011 - 2012)	26.8 (23.6-30.3)	26.2 (22.6-29.4)	41.5 (36.5-47.2)	63.5 (57.5-70.7)	84.4 (71.3-107)	395
Age 6-11 years (2013 - 2014)	23.0 (20.4-26.0)	21.1 (18.4-24.7)	33.8 (29.6-41.3)	64.7 (41.9-97.3)	97.3 (60.0-180)	409
Age 6-11 years (2015 - 2016)	18.9 (17.5-20.4)	17.5 (16.6-19.1)	27.3 (24.5-31.6)	48.3 (35.6-57.5)	62.5 (57.0-78.9)	415
Age 12-19 years (2011 - 2012)	13.9 (11.7-16.5)	12.5 (10.7-15.5)	22.2 (16.5-29.2)	41.4 (30.3-60.8)	70.9 (46.9-92.9)	388
Age 12-19 years (2013 - 2014)	11.0 (9.68-12.6)	10.2 (8.77-12.2)	16.9 (14.4-20.5)	28.9 (23.2-35.5)	40.7 (33.8-48.8)	462
Age 12-19 years (2015 - 2016)	7.29 (6.63-8.00)	6.85 (6.09-7.31)	10.3 (8.92-12.9)	16.5 (14.0-19.8)	23.2 (16.2-31.0)	405
Age 20+ years (2011 - 2012)	13.9 (13.0-14.8)	13.3 (12.4-14.4)	21.3 (19.5-22.8)	33.9 (30.6-39.0)	53.7 (42.9-63.2)	1704
Age 20+ years (2013 - 2014)	9.65 (8.80-10.6)	9.62 (8.61-10.4)	14.5 (13.0-16.3)	24.4 (21.0-28.3)	34.2 (28.9-39.6)	1813
Age 20+ years (2015 - 2016)	8.28 (7.72-8.87)	7.93 (7.39-8.55)	12.7 (11.9-13.4)	20.1 (17.8-22.2)	28.8 (23.1-36.2)	1690
Males (2011 - 2012)	13.3 (12.6-14.1)	12.5 (11.6-13.3)	20.1 (17.8-21.6)	35.0 (31.0-38.8)	56.4 (46.4-62.4)	1258
Males (2013 - 2014)	9.32 (8.50-10.2)	9.05 (8.18-9.88)	14.1 (12.6-15.5)	24.7 (21.0-29.0)	37.1 (33.8-41.9)	1284
Males (2015 - 2016)	8.35 (7.51-9.28)	7.65 (6.79-8.72)	13.1 (11.8-14.8)	22.9 (20.1-27.0)	36.0 (30.8-46.6)	1474
Females (2011 - 2012)	16.2 (14.6-18.0)	15.8 (14.1-17.7)	25.8 (22.2-29.4)	44.1 (37.6-50.8)	63.2 (54.3-72.4)	1229
Females (2013 - 2014)	11.9 (10.6-13.4)	11.4 (10.1-12.8)	18.2 (15.9-21.6)	30.1 (27.2-35.2)	42.5 (35.2-57.4)	1400
Females (2015 - 2016)	9.98 (9.36-10.6)	9.47 (8.55-10.3)	14.6 (13.7-16.3)	26.4 (23.6-29.3)	39.5 (35.4-45.5)	1500
Mexican Americans (2011 - 2012)	17.8 (14.6-21.6)	15.3 (12.7-19.8)	28.4 (21.9-39.0)	53.4 (44.7-62.9)	80.0 (52.4-115)	316
Mexican Americans (2013 - 2014)	13.6 (12.1-15.3)	12.1 (11.3-13.6)	22.0 (17.3-27.4)	39.5 (30.0-51.6)	55.9 (41.5-66.7)	438
Mexican Americans (2015 - 2016)	11.3 (10.4-12.3)	10.8 (9.69-12.0)	17.9 (16.0-19.3)	32.3 (27.3-41.0)	51.2 (41.9-63.8)	595
Non-Hispanic blacks (2011 - 2012)	12.8 (11.3-14.4)	11.8 (10.6-13.0)	20.8 (18.0-25.0)	40.4 (29.6-50.3)	59.4 (46.2-75.6)	665
Non-Hispanic blacks (2013 - 2014)	8.51 (7.48-9.68)	8.22 (7.07-9.65)	14.2 (12.1-16.4)	23.9 (20.9-27.1)	35.3 (27.3-41.6)	609
Non-Hispanic blacks (2015 - 2016)	8.51 (7.60-9.53)	7.81 (6.80-8.91)	14.3 (12.1-16.7)	25.7 (23.2-31.7)	45.2 (35.0-55.3)	697
Non-Hispanic whites (2011 - 2012)	14.3 (13.1-15.7)	13.9 (12.6-15.2)	21.8 (19.7-24.6)	34.3 (30.1-42.2)	54.9 (42.9-60.9)	811
Non-Hispanic whites (2013 - 2014)	10.3 (9.23-11.6)	10.0 (9.02-11.1)	15.4 (13.0-18.6)	27.2 (21.6-32.0)	35.9 (30.0-48.2)	987
Non-Hispanic whites (2015 - 2016)	8.67 (8.02-9.38)	8.04 (7.48-8.82)	13.1 (11.9-14.1)	20.9 (18.1-26.5)	33.6 (27.9-39.5)	862
All Hispanics (2011 - 2012)	17.9 (16.2-19.7)	15.7 (14.1-18.1)	30.0 (25.8-33.4)	53.4 (44.8-64.0)	80.0 (59.0-107)	571
All Hispanics (2013 - 2014)	13.0 (12.0-14.1)	12.1 (11.3-12.9)	20.7 (17.7-23.8)	37.6 (30.9-42.5)	54.1 (42.5-64.4)	690
All Hispanics (2015 - 2016)	10.7 (10.0-11.5)	10.1 (9.23-11.0)	17.6 (16.3-18.6)	31.7 (27.6-34.6)	48.3 (41.6-58.1)	971
Asians (2011 - 2012)	16.1 (13.7-18.9)	14.7 (12.3-17.2)	26.4 (21.7-33.0)	51.2 (41.5-76.9)	90.0 (51.0-142)	352
Asians (2013 - 2014)	11.5 (10.3-12.8)	10.8 (8.94-12.1)	18.2 (15.1-20.9)	30.7 (27.2-38.0)	40.8 (32.2-65.0)	288
Asians (2015 - 2016)	11.7 (10.2-13.5)	9.60 (8.53-10.8)	20.1 (16.2-22.9)	44.3 (26.5-60.0)	67.8 (45.2-107)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DEHP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(carboxynonyl) phthalate (MCNP) (2005 – 2010)

CAS Number 1373125-93-9

Metabolite of Di-isodecyl phthalate (DiDP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	2.73 (2.50-2.98)	2.70 (2.40-3.00)	5.30 (4.80-5.90)	10.2 (8.80-11.9)	17.5 (14.0-21.4)	2548
Total population (2007 - 2008)	2.42 (2.17-2.71)	2.40 (2.20-2.70)	4.70 (4.20-5.30)	9.20 (8.00-10.6)	16.1 (12.3-21.0)	2604
Total population (2009 - 2010)	2.88 (2.58-3.22)	2.91 (2.51-3.26)	5.52 (4.83-6.30)	10.6 (9.14-12.6)	16.8 (13.9-22.1)	2749
Age 6-11 years (2005 - 2006)	4.54 (3.94-5.24)	4.70 (4.00-5.60)	8.10 (6.80-9.60)	14.6 (10.8-19.1)	22.8 (16.7-35.3)	356
Age 6-11 years (2007 - 2008)	3.15 (2.65-3.74)	3.40 (2.90-3.80)	5.40 (4.60-6.80)	9.10 (7.40-12.3)	14.9 (9.10-24.8)	389
Age 6-11 years (2009 - 2010)	3.45 (2.95-4.03)	3.59 (3.04-4.34)	6.39 (5.39-7.41)	9.65 (8.75-11.2)	14.5 (10.4-23.2)	415
Age 12-19 years (2005 - 2006)	3.18 (2.74-3.68)	3.30 (2.90-3.80)	6.00 (4.70-7.20)	10.3 (7.60-13.7)	16.5 (11.5-21.5)	702
Age 12-19 years (2007 - 2008)	2.86 (2.59-3.16)	2.70 (2.40-2.90)	5.10 (4.30-5.70)	10.3 (8.90-13.0)	16.8 (10.7-32.4)	401
Age 12-19 years (2009 - 2010)	3.02 (2.61-3.51)	3.05 (2.41-3.65)	5.11 (4.49-6.43)	11.0 (7.24-14.6)	16.9 (10.9-32.0)	420
Age 20+ years (2005 - 2006)	2.51 (2.27-2.78)	2.40 (2.20-2.70)	4.90 (4.40-5.40)	9.50 (7.90-11.9)	17.0 (13.1-21.5)	1490
Age 20+ years (2007 - 2008)	2.29 (2.04-2.58)	2.30 (2.00-2.50)	4.50 (4.00-5.10)	9.10 (7.60-10.7)	16.1 (12.2-21.4)	1814
Age 20+ years (2009 - 2010)	2.81 (2.49-3.16)	2.80 (2.44-3.09)	5.52 (4.69-6.45)	10.7 (8.95-13.5)	17.3 (13.5-23.7)	1914
Males (2005 - 2006)	3.16 (2.82-3.54)	3.00 (2.70-3.50)	5.90 (5.10-6.90)	11.0 (8.80-14.0)	19.5 (14.0-28.0)	1270
Males (2007 - 2008)	2.75 (2.50-3.03)	2.60 (2.40-2.90)	5.10 (4.50-5.70)	9.50 (8.00-12.2)	19.4 (12.4-29.1)	1294
Males (2009 - 2010)	3.14 (2.80-3.53)	3.11 (2.72-3.61)	5.75 (5.13-6.56)	10.4 (9.14-11.5)	15.1 (12.5-20.5)	1399
Females (2005 - 2006)	2.37 (2.13-2.65)	2.30 (2.00-2.70)	4.80 (4.30-5.30)	9.30 (7.60-11.5)	14.7 (13.1-18.2)	1278
Females (2007 - 2008)	2.14 (1.84-2.49)	2.20 (1.80-2.60)	4.40 (3.80-4.90)	9.00 (7.30-10.3)	14.1 (10.8-18.5)	1310
Females (2009 - 2010)	2.66 (2.32-3.04)	2.60 (2.21-2.98)	5.21 (4.43-6.17)	11.6 (8.88-14.8)	17.5 (14.6-23.4)	1350
Mexican Americans (2005 - 2006)	2.72 (2.40-3.08)	2.70 (2.40-3.20)	4.90 (4.30-5.70)	9.00 (7.00-12.4)	14.4 (9.00-26.8)	637
Mexican Americans (2007 - 2008)	2.37 (2.15-2.62)	2.30 (2.10-2.60)	4.30 (3.70-5.10)	8.40 (6.50-10.5)	12.3 (8.40-16.2)	531
Mexican Americans (2009 - 2010)	2.35 (2.15-2.57)	2.51 (2.18-2.69)	4.35 (3.83-4.83)	7.72 (6.56-9.53)	11.0 (8.09-14.1)	566
Non-Hispanic blacks (2005 - 2006)	3.18 (2.75-3.67)	3.20 (2.70-3.80)	5.90 (4.90-7.30)	13.0 (9.50-14.6)	19.2 (14.6-30.5)	678
Non-Hispanic blacks (2007 - 2008)	2.89 (2.64-3.17)	2.90 (2.50-3.10)	5.60 (4.80-6.20)	11.9 (9.10-15.4)	21.7 (17.9-28.9)	597
Non-Hispanic blacks (2009 - 2010)	3.51 (2.92-4.22)	3.64 (2.97-4.24)	6.94 (5.75-8.47)	13.2 (10.2-17.5)	20.8 (13.5-41.7)	516
Non-Hispanic whites (2005 - 2006)	2.67 (2.39-2.98)	2.60 (2.30-2.90)	5.30 (4.70-6.10)	10.1 (8.20-12.6)	17.6 (12.6-24.3)	1038
Non-Hispanic whites (2007 - 2008)	2.42 (2.09-2.81)	2.40 (2.10-2.70)	4.70 (4.10-5.60)	9.10 (7.60-11.6)	14.9 (10.5-29.1)	1077
Non-Hispanic whites (2009 - 2010)	2.98 (2.61-3.40)	2.96 (2.53-3.48)	5.59 (4.78-6.57)	10.7 (8.83-14.3)	16.6 (12.6-23.7)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.6, 0.5, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiDP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(carboxynonyl) phthalate (MCNP) (2011 – 2016)

CAS Number 1373125-93-9

Metabolite of Di-isodecyl phthalate (DiDP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	2.49 (2.31-2.68)	2.40 (2.10-2.60)	4.60 (4.20-5.30)	8.90 (8.00-10.6)	15.2 (11.4-20.0)	2489
Total population (2013 - 2014)	2.81 (2.56-3.10)	2.70 (2.50-2.90)	5.60 (5.00-6.00)	11.1 (9.60-12.5)	17.4 (15.4-20.1)	2685
Total population (2015 - 2016)	1.75 (1.57-1.95)	1.80 (1.60-2.00)	3.30 (2.90-3.60)	6.00 (5.10-7.20)	9.90 (7.60-12.4)	2975
Age 3-5 years (2015 - 2016)	2.07 (1.86-2.30)	2.10 (1.80-2.30)	3.50 (3.20-3.90)	7.00 (5.80-8.20)	11.3 (8.20-15.2)	465
Age 6-11 years (2011 - 2012)	2.51 (2.15-2.93)	2.70 (2.00-3.00)	4.50 (3.80-5.40)	7.60 (6.60-8.90)	12.9 (7.90-15.4)	396
Age 6-11 years (2013 - 2014)	3.63 (3.21-4.10)	3.50 (2.90-4.20)	6.60 (5.50-7.90)	11.6 (8.80-16.3)	17.6 (11.6-28.5)	409
Age 6-11 years (2015 - 2016)	2.26 (1.99-2.57)	2.40 (2.00-2.80)	3.90 (3.40-4.50)	6.70 (5.90-8.00)	9.00 (7.50-12.4)	415
Age 12-19 years (2011 - 2012)	2.65 (2.24-3.13)	2.50 (2.20-3.00)	5.00 (4.00-6.30)	9.10 (7.70-10.5)	12.2 (10.3-18.0)	388
Age 12-19 years (2013 - 2014)	3.25 (2.81-3.75)	2.90 (2.70-3.50)	5.60 (4.60-7.10)	11.2 (8.30-14.7)	16.7 (12.7-22.5)	462
Age 12-19 years (2015 - 2016)	2.18 (1.86-2.54)	2.30 (1.90-2.60)	3.70 (3.20-4.00)	6.10 (4.90-7.80)	10.5 (6.90-14.6)	405
Age 20+ years (2011 - 2012)	2.46 (2.24-2.71)	2.30 (2.10-2.60)	4.60 (4.10-5.30)	9.00 (7.70-11.4)	16.9 (11.4-22.2)	1705
Age 20+ years (2013 - 2014)	2.68 (2.41-2.98)	2.60 (2.30-2.80)	5.40 (4.70-6.00)	10.7 (9.00-12.6)	17.5 (15.0-21.1)	1814
Age 20+ years (2015 - 2016)	1.63 (1.45-1.84)	1.60 (1.40-1.90)	3.00 (2.70-3.50)	5.70 (4.70-7.80)	10.0 (7.00-12.9)	1690
Males (2011 - 2012)	2.81 (2.52-3.14)	2.60 (2.30-3.10)	5.40 (4.60-6.20)	9.80 (8.10-14.3)	18.8 (10.7-22.9)	1259
Males (2013 - 2014)	3.14 (2.80-3.53)	3.00 (2.70-3.30)	6.00 (5.10-6.80)	11.8 (10.4-14.2)	18.9 (15.5-23.0)	1285
Males (2015 - 2016)	1.92 (1.66-2.22)	2.00 (1.70-2.30)	3.50 (3.10-3.80)	6.40 (5.30-8.60)	11.0 (8.00-12.9)	1474
Females (2011 - 2012)	2.21 (2.03-2.40)	2.20 (1.90-2.40)	4.10 (3.70-4.60)	8.50 (7.70-9.90)	12.0 (10.8-13.7)	1230
Females (2013 - 2014)	2.53 (2.24-2.85)	2.50 (2.10-2.80)	5.10 (4.40-5.70)	9.80 (8.50-11.7)	16.0 (12.8-20.4)	1400
Females (2015 - 2016)	1.59 (1.41-1.80)	1.60 (1.40-1.90)	3.00 (2.60-3.30)	5.60 (4.40-7.20)	8.90 (6.40-15.2)	1501
Mexican Americans (2011 - 2012)	2.22 (1.87-2.64)	2.10 (1.70-2.30)	3.70 (3.10-4.30)	7.20 (4.80-11.0)	17.8 (7.90-28.5)	316
Mexican Americans (2013 - 2014)	2.48 (2.18-2.83)	2.50 (2.20-2.90)	4.30 (3.70-5.00)	7.50 (6.30-8.90)	10.2 (8.30-15.5)	438
Mexican Americans (2015 - 2016)	1.64 (1.47-1.83)	1.70 (1.50-1.90)	2.90 (2.50-3.30)	5.10 (4.40-5.90)	6.80 (6.20-8.10)	595
Non-Hispanic blacks (2011 - 2012)	3.02 (2.82-3.25)	2.90 (2.70-3.20)	6.00 (5.00-7.20)	10.2 (8.90-12.5)	17.3 (12.5-21.0)	665
Non-Hispanic blacks (2013 - 2014)	3.05 (2.77-3.36)	2.90 (2.60-3.20)	5.60 (4.50-6.60)	10.9 (9.50-11.9)	16.7 (11.7-21.5)	609
Non-Hispanic blacks (2015 - 2016)	2.21 (1.84-2.67)	2.10 (1.60-2.70)	4.40 (3.50-5.40)	8.80 (7.10-10.0)	14.6 (10.0-18.3)	698
Non-Hispanic whites (2011 - 2012)	2.55 (2.31-2.82)	2.50 (2.10-2.80)	4.80 (4.10-5.60)	9.00 (7.70-11.4)	15.2 (10.3-20.8)	813
Non-Hispanic whites (2013 - 2014)	2.88 (2.55-3.25)	2.80 (2.50-3.00)	5.70 (4.90-6.50)	11.4 (9.30-13.8)	17.1 (15.4-20.1)	987
Non-Hispanic whites (2015 - 2016)	1.76 (1.54-2.00)	1.80 (1.50-2.10)	3.30 (2.90-3.60)	6.00 (5.00-8.10)	10.5 (7.20-13.1)	862
All Hispanics (2011 - 2012)	2.27 (2.04-2.53)	2.10 (1.80-2.40)	3.80 (3.40-4.50)	7.90 (6.30-10.4)	16.1 (10.8-21.0)	571
All Hispanics (2013 - 2014)	2.65 (2.38-2.95)	2.60 (2.30-2.90)	4.90 (4.30-5.40)	8.90 (7.70-11.0)	15.0 (11.0-21.1)	690
All Hispanics (2015 - 2016)	1.66 (1.48-1.85)	1.70 (1.50-1.90)	3.00 (2.70-3.50)	5.10 (4.50-5.70)	6.70 (6.20-7.40)	971
Asians (2011 - 2012)	1.56 (1.33-1.83)	1.40 (1.20-1.50)	2.90 (2.30-4.10)	7.30 (5.90-8.50)	11.2 (8.10-20.0)	352
Asians (2013 - 2014)	1.82 (1.54-2.15)	1.70 (1.40-2.00)	3.80 (2.80-4.50)	7.10 (5.00-14.0)	14.0 (7.10-29.2)	289
Asians (2015 - 2016)	1.13 (.917-1.39)	1.10 (.900-1.50)	2.20 (1.90-2.80)	4.60 (2.70-7.80)	7.80 (3.90-19.6)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.2, 0.2, and 0.2, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiDP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(carboxynonyl) phthalate (MCNP) (creatinine corrected) (2005 – 2010)

CAS Number 1373125-93-9

Metabolite of Di-isodecyl phthalate (DiDP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	2.66 (2.43-2.91)	2.48 (2.29-2.71)	4.48 (4.05-4.85)	8.67 (7.17-9.71)	13.2 (10.8-17.5)	2548
Total population (2007 - 2008)	2.44 (2.25-2.65)	2.21 (2.00-2.36)	4.00 (3.68-4.44)	8.31 (6.96-9.04)	12.8 (11.2-15.1)	2604
Total population (2009 - 2010)	3.01 (2.74-3.31)	2.79 (2.48-3.10)	5.04 (4.47-5.66)	9.76 (8.41-11.2)	15.5 (12.8-18.9)	2749
Age 6-11 years (2005 - 2006)	5.00 (4.45-5.63)	5.06 (4.18-5.76)	7.48 (6.70-8.84)	16.1 (12.5-18.9)	23.5 (16.1-31.7)	356
Age 6-11 years (2007 - 2008)	3.88 (3.34-4.50)	3.82 (3.17-4.18)	6.07 (5.14-7.00)	11.2 (9.01-13.6)	18.2 (12.6-27.0)	389
Age 6-11 years (2009 - 2010)	4.49 (4.01-5.03)	4.33 (3.95-4.82)	7.30 (6.41-8.54)	11.2 (9.74-13.6)	14.9 (12.7-23.1)	415
Age 12-19 years (2005 - 2006)	2.37 (2.04-2.75)	2.18 (1.91-2.52)	3.64 (2.94-4.55)	6.26 (5.15-8.70)	10.7 (7.57-14.1)	702
Age 12-19 years (2007 - 2008)	2.23 (2.07-2.40)	1.96 (1.83-2.08)	3.68 (3.08-3.83)	6.39 (4.88-9.01)	10.0 (7.26-13.5)	401
Age 12-19 years (2009 - 2010)	2.43 (2.10-2.81)	2.17 (1.79-2.54)	3.94 (3.23-4.87)	7.67 (5.32-11.2)	12.8 (8.43-14.4)	420
Age 20+ years (2005 - 2006)	2.52 (2.29-2.78)	2.37 (2.14-2.57)	4.05 (3.77-4.51)	7.90 (6.46-9.40)	12.0 (9.71-16.7)	1490
Age 20+ years (2007 - 2008)	2.36 (2.15-2.58)	2.14 (1.91-2.32)	3.88 (3.44-4.29)	8.21 (6.67-9.00)	12.3 (11.0-15.3)	1814
Age 20+ years (2009 - 2010)	2.97 (2.69-3.29)	2.72 (2.43-3.03)	4.93 (4.32-5.62)	9.68 (7.90-11.6)	15.6 (11.9-22.5)	1914
Males (2005 - 2006)	2.53 (2.28-2.82)	2.36 (2.14-2.56)	4.38 (3.74-5.04)	7.41 (6.47-8.88)	13.0 (9.40-19.6)	1270
Males (2007 - 2008)	2.32 (2.11-2.55)	2.12 (1.90-2.32)	3.88 (3.50-4.29)	7.13 (5.78-9.15)	11.4 (9.68-15.5)	1294
Males (2009 - 2010)	2.82 (2.55-3.12)	2.56 (2.28-2.96)	4.73 (4.19-5.49)	8.68 (7.21-10.2)	13.4 (11.2-15.4)	1399
Females (2005 - 2006)	2.79 (2.47-3.15)	2.65 (2.34-2.95)	4.51 (4.03-5.15)	9.41 (6.82-11.6)	13.5 (10.7-19.7)	1278
Females (2007 - 2008)	2.57 (2.33-2.83)	2.27 (2.03-2.57)	4.13 (3.78-4.82)	8.71 (7.41-9.50)	13.5 (12.0-16.0)	1310
Females (2009 - 2010)	3.20 (2.88-3.57)	2.98 (2.72-3.28)	5.40 (4.70-6.23)	10.6 (8.39-13.8)	16.9 (12.5-27.3)	1350
Mexican Americans (2005 - 2006)	2.45 (2.13-2.81)	2.32 (2.14-2.60)	4.04 (3.64-4.58)	6.96 (5.73-8.14)	11.0 (7.89-19.1)	637
Mexican Americans (2007 - 2008)	2.32 (2.10-2.56)	2.10 (1.90-2.34)	4.12 (3.54-4.68)	6.89 (5.73-7.67)	9.75 (7.69-11.7)	531
Mexican Americans (2009 - 2010)	2.33 (2.08-2.62)	2.12 (1.80-2.66)	3.80 (3.27-4.58)	7.02 (5.44-9.66)	11.3 (8.09-13.0)	566
Non-Hispanic blacks (2005 - 2006)	2.24 (1.96-2.55)	1.97 (1.78-2.37)	3.60 (3.25-4.24)	7.82 (6.38-10.4)	12.1 (10.1-17.4)	678
Non-Hispanic blacks (2007 - 2008)	2.25 (2.05-2.47)	2.00 (1.88-2.17)	3.88 (3.50-4.27)	8.18 (6.25-10.4)	14.9 (9.31-20.4)	597
Non-Hispanic blacks (2009 - 2010)	2.54 (2.24-2.88)	2.46 (2.02-2.96)	4.52 (4.20-5.13)	8.51 (6.35-10.9)	11.3 (9.81-16.0)	516
Non-Hispanic whites (2005 - 2006)	2.81 (2.51-3.14)	2.57 (2.33-2.85)	4.62 (4.10-5.19)	9.26 (7.00-10.8)	13.5 (10.3-23.5)	1038
Non-Hispanic whites (2007 - 2008)	2.53 (2.23-2.86)	2.26 (1.98-2.57)	4.11 (3.66-4.70)	8.51 (6.59-10.2)	13.3 (10.7-17.6)	1077
Non-Hispanic whites (2009 - 2010)	3.35 (2.98-3.77)	3.06 (2.76-3.36)	5.51 (4.74-6.35)	10.4 (8.43-13.5)	15.8 (12.3-24.8)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiDP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(carboxynonyl) phthalate (MCNP) (creatinine corrected) (2011 – 2016)

CAS Number 1373125-93-9

Metabolite of Di-isodecyl phthalate (DiDP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	2.83 (2.57-3.11)	2.50 (2.28-2.80)	4.59 (4.13-5.29)	9.36 (7.85-11.1)	14.6 (11.9-16.8)	2487
Total population (2013 - 2014)	2.82 (2.65-3.00)	2.62 (2.45-2.83)	4.60 (4.29-5.12)	8.85 (8.01-10.0)	14.4 (12.9-16.0)	2684
Total population (2015 - 2016)	1.81 (1.67-1.96)	1.73 (1.54-1.88)	2.96 (2.69-3.30)	5.17 (4.63-5.86)	8.33 (6.73-9.60)	2974
Age 3-5 years (2015 - 2016)	4.94 (4.53-5.38)	4.70 (4.17-5.28)	7.54 (6.82-8.40)	12.6 (10.4-16.1)	20.0 (15.6-23.7)	464
Age 6-11 years (2011 - 2012)	3.55 (3.13-4.03)	3.16 (2.73-3.94)	5.25 (4.55-6.45)	9.15 (6.64-14.3)	14.7 (10.0-16.8)	395
Age 6-11 years (2013 - 2014)	4.59 (4.06-5.18)	4.33 (3.69-4.75)	7.33 (5.75-8.95)	13.1 (8.40-17.7)	18.9 (13.1-31.1)	409
Age 6-11 years (2015 - 2016)	2.92 (2.65-3.21)	2.75 (2.50-3.04)	4.46 (3.78-5.10)	6.67 (5.94-8.30)	9.51 (7.02-14.8)	415
Age 12-19 years (2011 - 2012)	2.58 (2.16-3.09)	2.34 (1.96-3.04)	4.67 (3.38-6.13)	7.74 (5.97-11.3)	12.0 (7.74-15.6)	388
Age 12-19 years (2013 - 2014)	2.64 (2.38-2.91)	2.43 (2.07-2.79)	4.02 (3.57-4.79)	7.73 (5.73-9.22)	12.0 (8.10-19.0)	462
Age 12-19 years (2015 - 2016)	1.69 (1.54-1.86)	1.58 (1.32-1.82)	2.59 (2.21-2.96)	4.61 (4.15-5.65)	6.24 (5.37-9.62)	405
Age 20+ years (2011 - 2012)	2.79 (2.51-3.10)	2.43 (2.21-2.77)	4.46 (4.02-5.27)	9.73 (7.85-11.7)	14.9 (11.8-17.5)	1704
Age 20+ years (2013 - 2014)	2.70 (2.50-2.91)	2.52 (2.34-2.78)	4.38 (3.93-5.00)	8.62 (7.62-9.77)	14.0 (12.2-15.4)	1813
Age 20+ years (2015 - 2016)	1.67 (1.53-1.81)	1.55 (1.37-1.77)	2.71 (2.42-3.00)	4.62 (3.88-5.41)	7.44 (5.68-9.61)	1690
Males (2011 - 2012)	2.63 (2.42-2.86)	2.37 (2.17-2.54)	4.43 (3.83-4.92)	8.49 (6.61-10.0)	12.5 (9.58-15.5)	1258
Males (2013 - 2014)	2.64 (2.43-2.87)	2.49 (2.32-2.75)	4.20 (3.79-5.00)	8.20 (7.50-9.77)	13.5 (11.2-17.4)	1284
Males (2015 - 2016)	1.71 (1.53-1.92)	1.61 (1.41-1.82)	2.76 (2.40-3.40)	5.00 (4.43-5.68)	6.96 (5.86-8.89)	1474
Females (2011 - 2012)	3.03 (2.65-3.46)	2.70 (2.30-3.21)	4.82 (4.18-5.80)	10.7 (8.66-12.1)	15.6 (12.3-17.6)	1229
Females (2013 - 2014)	3.00 (2.72-3.31)	2.74 (2.47-3.06)	5.16 (4.51-5.69)	9.60 (8.10-11.7)	15.4 (12.7-17.7)	1400
Females (2015 - 2016)	1.90 (1.73-2.10)	1.80 (1.61-1.97)	3.06 (2.75-3.40)	5.50 (4.62-6.60)	9.62 (7.37-12.7)	1500
Mexican Americans (2011 - 2012)	2.50 (2.21-2.83)	2.18 (2.02-2.42)	3.73 (3.00-4.38)	8.00 (5.46-10.7)	13.2 (8.49-18.8)	316
Mexican Americans (2013 - 2014)	2.53 (2.32-2.76)	2.39 (2.31-2.58)	3.75 (3.51-4.13)	6.80 (5.61-7.89)	9.44 (7.65-11.5)	438
Mexican Americans (2015 - 2016)	1.79 (1.61-1.99)	1.71 (1.47-1.95)	2.76 (2.56-2.97)	4.92 (4.16-6.04)	7.27 (6.00-9.33)	595
Non-Hispanic blacks (2011 - 2012)	2.35 (2.19-2.53)	2.20 (2.06-2.39)	3.99 (3.56-4.38)	6.95 (6.17-8.18)	12.1 (9.30-15.7)	665
Non-Hispanic blacks (2013 - 2014)	2.25 (2.11-2.41)	2.10 (1.93-2.37)	3.68 (3.26-4.29)	7.27 (6.21-8.16)	11.6 (8.69-15.3)	609
Non-Hispanic blacks (2015 - 2016)	1.76 (1.57-1.98)	1.64 (1.44-1.88)	3.11 (2.61-3.71)	5.68 (5.07-6.87)	9.68 (8.33-11.8)	697
Non-Hispanic whites (2011 - 2012)	3.09 (2.75-3.47)	2.75 (2.36-3.25)	5.05 (4.35-5.89)	10.4 (8.08-12.3)	15.3 (11.9-17.6)	811
Non-Hispanic whites (2013 - 2014)	3.03 (2.80-3.28)	2.86 (2.61-3.08)	5.07 (4.43-5.65)	9.51 (8.19-11.1)	15.4 (12.5-17.7)	987
Non-Hispanic whites (2015 - 2016)	1.89 (1.72-2.07)	1.79 (1.56-1.94)	3.04 (2.64-3.46)	5.29 (4.46-6.34)	8.99 (6.40-10.4)	862
All Hispanics (2011 - 2012)	2.54 (2.37-2.73)	2.25 (2.06-2.42)	3.92 (3.54-4.41)	8.20 (6.72-9.71)	13.9 (10.0-16.8)	571
All Hispanics (2013 - 2014)	2.63 (2.45-2.82)	2.47 (2.37-2.60)	4.01 (3.70-4.57)	7.50 (6.78-8.85)	11.5 (8.85-14.1)	690
All Hispanics (2015 - 2016)	1.75 (1.58-1.93)	1.71 (1.44-1.94)	2.80 (2.58-3.13)	4.82 (4.02-5.67)	6.69 (5.90-7.66)	971
Asians (2011 - 2012)	2.09 (1.76-2.49)	1.95 (1.70-2.19)	3.75 (3.04-4.44)	6.36 (5.53-7.89)	9.02 (7.50-17.9)	352
Asians (2013 - 2014)	2.29 (1.97-2.67)	1.91 (1.69-2.27)	4.10 (3.24-5.38)	8.89 (5.46-19.2)	19.2 (8.50-41.1)	288
Asians (2015 - 2016)	1.40 (1.23-1.59)	1.25 (1.07-1.53)	2.35 (1.94-2.75)	4.90 (3.10-7.70)	7.70 (5.17-12.7)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiDP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isononyl phthalate (MiNP) (1999 – 2010)

CAS Number 297182-83-3

Metabolite of Di-isononyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	5.39 (<LOD-21.3)	2541
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2782
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	1.54 (<LOD-2.00)	2605
Total population (2005 - 2006)	*	< LOD	< LOD	1.69 (<LOD-2.00)	3.54 (2.31-6.16)	2548
Total population (2007 - 2008)	*	< LOD	< LOD	1.54 (<LOD-1.69)	3.08 (2.16-4.16)	2604
Total population (2009 - 2010)	*	< LOD	1.80 (1.49-2.13)	5.62 (4.48-7.28)	14.6 (10.7-18.3)	2749
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	9.55 (<LOD-34.7)	328
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	1.54 (<LOD-2.31)	2.62 (1.85-4.77)	342
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	1.69 (<LOD-2.00)	2.16 (2.00-2.62)	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	1.39 (<LOD-2.00)	2.16 (1.54-3.85)	389
Age 6-11 years (2009 - 2010)	*	< LOD	1.72 (1.09-2.94)	5.30 (3.08-8.98)	13.1 (5.33-21.5)	415
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	3.54 (<LOD-31.3)	752
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	1.39 (<LOD-1.69)	742
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	2.16 (<LOD-2.77)	729
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	2.16 (<LOD-4.31)	5.39 (2.00-12.2)	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	2.46 (1.39-5.39)	5.54 (2.46-8.01)	401
Age 12-19 years (2009 - 2010)	*	< LOD	2.20 (1.42-3.96)	10.7 (4.87-17.1)	20.6 (14.8-36.1)	420
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	4.77 (<LOD-20.3)	1461
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1647
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1534
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	1.54 (<LOD-2.00)	3.54 (2.16-6.47)	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	1.39 (<LOD-1.69)	2.77 (1.85-3.85)	1814
Age 20+ years (2009 - 2010)	*	< LOD	1.76 (1.43-2.11)	5.44 (4.31-6.64)	12.9 (8.32-17.9)	1914
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	7.55 (<LOD-29.1)	1215
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1371
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	1.54 (<LOD-2.77)	1250
Males (2005 - 2006)	*	< LOD	< LOD	2.00 (1.39-2.93)	4.00 (3.23-6.31)	1270
Males (2007 - 2008)	*	< LOD	< LOD	1.54 (<LOD-2.16)	3.23 (2.31-4.93)	1294
Males (2009 - 2010)	*	< LOD	2.06 (1.74-2.68)	7.19 (5.62-10.5)	17.1 (11.7-27.6)	1399
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	3.85 (<LOD-10.5)	1326
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	1.39 (<LOD-1.69)	1411
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1355
Females (2005 - 2006)	*	< LOD	< LOD	1.39 (<LOD-1.54)	2.62 (1.85-4.31)	1278
Females (2007 - 2008)	*	< LOD	< LOD	1.39 (<LOD-1.69)	2.77 (2.00-3.70)	1310
Females (2009 - 2010)	*	< LOD	1.52 (1.12-1.91)	4.70 (3.80-5.47)	12.3 (6.61-16.5)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.23, 1.23, 1.54, 1.23, 1.23, and 0.77 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 1.54 for survey periods 1999-2008 compared with results previously reported.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isononyl phthalate (MiNP) (1999 – 2010)

CAS Number 297182-83-3

Metabolite of Di-isononyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	2.31 (<LOD-4.31)	814
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	1.54 (<LOD-2.16)	677
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	652
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	1.54 (<LOD-2.00)	4.31 (2.00-8.62)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	1.39 (<LOD-2.93)	3.08 (2.00-3.85)	531
Mexican Americans (2009 - 2010)	*	< LOD	1.52 (1.19-1.91)	5.11 (3.77-7.67)	12.9 (6.27-22.2)	566
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	3.54 (<LOD-21.3)	10.5 (<LOD-46.5)	603
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	1.54 (<LOD-2.62)	703
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	2.00 (1.54-3.08)	699
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	2.00 (1.54-2.77)	5.70 (3.54-8.62)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	1.69 (<LOD-2.31)	3.70 (2.16-5.70)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	2.14 (1.79-2.56)	6.05 (4.48-10.5)	17.1 (8.32-21.9)	516
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	5.39 (<LOD-24.6)	912
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1216
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1088
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	1.54 (<LOD-2.16)	3.23 (1.85-6.47)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	1.39 (<LOD-2.00)	2.77 (1.69-4.93)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	1.83 (1.40-2.53)	5.67 (4.59-8.07)	14.7 (10.3-21.5)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.23, 1.23, 1.54, 1.23, 1.23, and 0.77 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 1.54 for survey periods 1999-2008 compared with results previously reported

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isononyl phthalate (MiNP) (2011 – 2016)

CAS Number 297182-83-3

Metabolite of Di-isononyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	.800 (.600-.900)	2.60 (2.00-3.20)	8.80 (6.80-12.5)	18.6 (13.3-28.3)	2489
Total population (2013 - 2014)	*	< LOD	1.80 (1.60-2.10)	5.70 (4.60-7.00)	12.3 (9.10-16.3)	2685
Total population (2015 - 2016)	*	< LOD	< LOD	2.20 (1.50-3.80)	5.30 (3.10-9.80)	2975
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	1.60 (1.30-2.20)	2.90 (1.90-9.10)	465
Age 6-11 years (2011 - 2012)	*	.700 (<LOD-1.10)	1.90 (1.50-2.50)	4.40 (2.50-6.20)	6.20 (4.40-11.4)	396
Age 6-11 years (2013 - 2014)	*	< LOD	2.10 (1.70-3.00)	6.50 (4.10-10.1)	11.0 (8.70-17.9)	409
Age 6-11 years (2015 - 2016)	*	< LOD	1.00 (<LOD-1.30)	2.30 (1.40-4.80)	5.00 (3.40-10.2)	415
Age 12-19 years (2011 - 2012)	1.36 (1.12-1.65)	.900 (.800-1.20)	2.80 (2.20-4.00)	13.1 (5.90-23.4)	24.9 (17.8-90.6)	388
Age 12-19 years (2013 - 2014)	*	< LOD	2.80 (1.60-3.70)	8.80 (5.00-16.3)	17.6 (8.70-25.5)	462
Age 12-19 years (2015 - 2016)	*	< LOD	1.10 (<LOD-1.30)	2.20 (1.50-4.20)	4.80 (2.20-14.3)	405
Age 20+ years (2011 - 2012)	*	.700 (.600-.800)	2.70 (2.00-3.40)	9.60 (7.30-13.0)	18.4 (13.1-32.1)	1705
Age 20+ years (2013 - 2014)	*	< LOD	1.70 (1.40-2.10)	5.10 (4.10-6.70)	11.8 (8.80-15.8)	1814
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	2.30 (1.50-3.80)	5.60 (3.10-10.0)	1690
Males (2011 - 2012)	1.26 (1.12-1.42)	.900 (.800-1.10)	3.10 (2.60-3.70)	9.30 (7.20-12.8)	20.0 (12.5-39.6)	1259
Males (2013 - 2014)	*	< LOD	1.90 (1.50-2.50)	6.50 (4.60-7.40)	12.3 (7.70-17.6)	1285
Males (2015 - 2016)	*	< LOD	1.00 (<LOD-1.30)	2.60 (1.90-4.70)	6.10 (3.80-11.1)	1474
Females (2011 - 2012)	*	.700 (<LOD-.800)	2.10 (1.70-2.80)	8.20 (4.50-14.4)	18.4 (14.9-26.9)	1230
Females (2013 - 2014)	*	< LOD	1.70 (1.40-2.10)	5.50 (4.20-7.70)	12.6 (8.70-17.9)	1400
Females (2015 - 2016)	*	< LOD	< LOD	1.90 (1.30-3.10)	3.80 (2.00-10.0)	1501
Mexican Americans (2011 - 2012)	*	.700 (<LOD-1.10)	2.30 (1.50-3.20)	5.30 (3.70-7.70)	16.8 (5.60-31.2)	316
Mexican Americans (2013 - 2014)	*	< LOD	1.50 (1.00-2.00)	5.00 (3.90-7.60)	10.1 (6.60-13.4)	438
Mexican Americans (2015 - 2016)	*	< LOD	1.00 (<LOD-1.20)	2.90 (2.00-4.40)	7.70 (3.20-10.6)	595
Non-Hispanic blacks (2011 - 2012)	1.40 (1.19-1.65)	1.00 (.900-1.20)	3.20 (2.40-4.30)	13.1 (7.70-19.5)	24.1 (15.3-36.8)	665
Non-Hispanic blacks (2013 - 2014)	*	< LOD	2.20 (1.60-2.90)	6.80 (4.30-9.20)	14.3 (8.70-18.4)	609
Non-Hispanic blacks (2015 - 2016)	*	< LOD	1.10 (<LOD-1.60)	2.80 (1.60-7.20)	7.30 (2.70-20.5)	698
Non-Hispanic whites (2011 - 2012)	*	.700 (<LOD-.900)	2.60 (1.90-3.40)	9.20 (6.30-12.6)	17.5 (13.0-33.5)	813
Non-Hispanic whites (2013 - 2014)	*	< LOD	1.70 (1.40-2.10)	5.40 (4.10-7.10)	11.3 (8.70-15.8)	987
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	2.10 (1.40-3.10)	4.80 (2.40-9.60)	862
All Hispanics (2011 - 2012)	*	.800 (.600-1.00)	2.40 (1.80-3.30)	6.20 (4.40-9.30)	17.9 (10.4-24.9)	571
All Hispanics (2013 - 2014)	*	< LOD	1.80 (1.40-2.60)	5.80 (4.70-8.80)	13.1 (8.70-18.5)	690
All Hispanics (2015 - 2016)	*	< LOD	1.10 (<LOD-1.30)	3.00 (1.90-5.00)	7.70 (4.50-10.6)	971
Asians (2011 - 2012)	*	.700 (<LOD-.800)	2.30 (1.40-3.60)	6.50 (5.30-9.80)	19.1 (7.80-25.9)	352
Asians (2013 - 2014)	*	< LOD	1.70 (1.20-2.20)	3.80 (2.80-6.50)	7.90 (4.80-19.6)	289
Asians (2015 - 2016)	*	< LOD	1.10 (<LOD-1.70)	2.70 (1.50-4.20)	4.20 (2.50-20.1)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.6, 0.9, and 0.9, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isononyl phthalate (MiNP) (creatinine corrected) (1999 – 2010)

CAS Number 297182-83-3

Metabolite of Di-isononyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	< LOD	6.61 (<LOD-12.8)	2541
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2782
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	4.50 (<LOD-4.90)	2605
Total population (2005 - 2006)	*	< LOD	< LOD	3.20 (<LOD-3.82)	5.16 (3.99-5.67)	2548
Total population (2007 - 2008)	*	< LOD	< LOD	3.35 (<LOD-3.96)	5.05 (4.15-6.22)	2604
Total population (2009 - 2010)	*	< LOD	2.16 (1.91-2.41)	5.40 (4.21-7.00)	11.8 (9.59-14.2)	2749
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	< LOD	9.24 (<LOD-21.9)	328
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	3.71 (<LOD-4.82)	5.04 (3.71-7.19)	342
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	2.37 (<LOD-2.93)	3.03 (2.54-5.16)	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	3.35 (<LOD-5.33)	5.33 (3.11-7.26)	389
Age 6-11 years (2009 - 2010)	*	< LOD	2.53 (1.93-3.09)	6.61 (3.77-9.73)	10.7 (6.70-21.7)	415
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	< LOD	3.08 (<LOD-11.8)	752
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	3.19 (<LOD-5.13)	742
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	3.03 (<LOD-3.99)	729
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	2.66 (<LOD-3.59)	3.99 (2.97-5.28)	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	2.56 (2.10-3.23)	3.68 (2.90-6.84)	401
Age 12-19 years (2009 - 2010)	*	< LOD	2.14 (1.40-3.40)	7.58 (4.06-11.2)	13.2 (10.2-23.4)	420
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	< LOD	7.11 (<LOD-12.4)	1461
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1647
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1534
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	3.37 (<LOD-4.19)	5.17 (4.17-6.11)	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	3.48 (<LOD-4.15)	5.45 (4.15-6.39)	1814
Age 20+ years (2009 - 2010)	*	< LOD	2.12 (1.86-2.35)	5.00 (3.91-6.67)	11.7 (8.29-14.5)	1914
Males (1999 - 2000)	*	< LOD	< LOD	< LOD	6.53 (<LOD-15.7)	1215
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1371
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	3.56 (<LOD-4.54)	1250
Males (2005 - 2006)	*	< LOD	< LOD	2.51 (1.96-3.51)	3.99 (2.79-5.61)	1270
Males (2007 - 2008)	*	< LOD	< LOD	2.42 (<LOD-2.95)	3.96 (3.23-5.05)	1294
Males (2009 - 2010)	*	< LOD	1.91 (1.59-2.37)	5.54 (4.14-7.89)	12.9 (9.90-18.8)	1399
Females (1999 - 2000)	*	< LOD	< LOD	< LOD	6.61 (<LOD-11.8)	1326
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	4.20 (<LOD-4.40)	1411
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1355
Females (2005 - 2006)	*	< LOD	< LOD	3.67 (<LOD-4.39)	5.37 (4.88-6.27)	1278
Females (2007 - 2008)	*	< LOD	< LOD	4.08 (<LOD-4.84)	5.81 (4.36-7.26)	1310
Females (2009 - 2010)	*	< LOD	2.35 (2.01-2.49)	5.40 (4.13-7.00)	10.8 (7.58-14.9)	1350

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 1.54 for survey periods 1999-2008 compared with results previously reported

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isononyl phthalate (MiNP) (creatinine corrected) (1999 – 2010)

CAS Number 297182-83-3

Metabolite of Di-isononyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	< LOD	5.44 (<LOD-7.70)	814
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	3.70 (<LOD-4.20)	677
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	652
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	2.71 (<LOD-3.73)	4.88 (3.73-6.27)	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	2.81 (<LOD-3.23)	3.96 (3.23-5.13)	531
Mexican Americans (2009 - 2010)	*	< LOD	1.74 (1.42-2.35)	4.35 (3.10-9.92)	11.5 (8.42-19.1)	566
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	3.13 (<LOD-8.18)	6.61 (<LOD-22.1)	603
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	2.71 (<LOD-3.30)	703
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	3.37 (2.57-3.85)	699
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	2.22 (1.83-2.59)	4.39 (2.83-6.75)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	2.49 (<LOD-3.35)	4.19 (3.11-4.62)	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	1.51 (1.25-1.80)	4.00 (2.90-5.61)	8.97 (5.15-15.1)	516
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	< LOD	8.39 (<LOD-15.4)	912
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1216
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1088
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	3.37 (<LOD-3.99)	4.88 (3.99-5.41)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	3.60 (<LOD-4.15)	5.45 (3.96-6.96)	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	2.41 (2.08-2.70)	6.00 (4.23-8.05)	12.9 (10.4-16.6)	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 1.54 for survey periods 1999-2008 compared with results previously reported

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-isononyl phthalate (MiNP) (creatinine corrected) (2011 – 2016)

CAS Number 297182-83-3

Metabolite of Di-isononyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	1.08 (.921-1.25)	2.69 (2.25-3.26)	7.88 (5.88-11.3)	17.6 (11.6-26.6)	2487
Total population (2013 - 2014)	*	< LOD	2.29 (1.98-2.50)	5.39 (4.83-6.00)	9.64 (8.34-11.7)	2684
Total population (2015 - 2016)	*	< LOD	< LOD	3.05 (2.60-3.77)	5.33 (4.00-7.11)	2974
Age 3-5 years (2015 - 2016)	*	< LOD	< LOD	5.82 (4.57-7.11)	8.84 (6.40-12.4)	464
Age 6-11 years (2011 - 2012)	*	1.13 (<LOD-1.40)	2.44 (1.84-2.98)	4.20 (3.27-7.88)	7.88 (4.00-15.2)	395
Age 6-11 years (2013 - 2014)	*	< LOD	3.17 (2.47-4.07)	7.14 (5.11-13.2)	14.3 (7.81-17.0)	409
Age 6-11 years (2015 - 2016)	*	< LOD	2.00 (<LOD-2.46)	3.56 (2.78-5.00)	6.60 (3.94-9.79)	415
Age 12-19 years (2011 - 2012)	1.33 (1.05-1.68)	1.01 (.818-1.40)	2.72 (1.94-3.89)	10.6 (4.63-17.6)	33.0 (11.8-53.5)	388
Age 12-19 years (2013 - 2014)	*	< LOD	2.18 (1.60-3.22)	7.33 (4.74-9.72)	11.7 (7.73-22.4)	462
Age 12-19 years (2015 - 2016)	*	< LOD	1.14 (<LOD-1.28)	1.93 (1.62-2.78)	3.84 (2.07-9.14)	405
Age 20+ years (2011 - 2012)	*	1.09 (.876-1.30)	2.78 (2.22-3.33)	8.23 (5.95-11.4)	18.1 (11.4-33.8)	1704
Age 20+ years (2013 - 2014)	*	< LOD	2.21 (1.94-2.46)	4.92 (3.97-6.01)	8.97 (7.29-11.4)	1813
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	3.05 (2.48-3.92)	5.06 (4.00-6.94)	1690
Males (2011 - 2012)	1.18 (1.04-1.33)	.982 (.778-1.16)	2.50 (2.15-3.06)	7.88 (5.65-11.4)	15.6 (10.1-24.1)	1258
Males (2013 - 2014)	*	< LOD	1.84 (1.64-2.13)	4.34 (3.27-6.57)	8.69 (6.81-11.7)	1284
Males (2015 - 2016)	*	< LOD	1.39 (<LOD-1.58)	2.78 (2.46-3.77)	4.92 (3.77-6.87)	1474
Females (2011 - 2012)	*	1.21 (<LOD-1.40)	2.86 (2.18-3.88)	7.73 (5.20-13.0)	20.1 (11.4-33.8)	1229
Females (2013 - 2014)	*	< LOD	2.56 (2.29-2.82)	5.95 (4.83-7.29)	11.7 (8.28-16.1)	1400
Females (2015 - 2016)	*	< LOD	< LOD	3.20 (2.67-4.03)	5.56 (3.72-8.84)	1500
Mexican Americans (2011 - 2012)	*	.942 (<LOD-1.13)	2.04 (1.65-2.50)	4.68 (3.19-13.8)	17.1 (8.39-42.6)	316
Mexican Americans (2013 - 2014)	*	< LOD	1.82 (1.39-2.75)	4.42 (2.79-8.39)	9.41 (5.40-12.1)	438
Mexican Americans (2015 - 2016)	*	< LOD	1.76 (<LOD-2.13)	3.37 (2.67-5.56)	6.71 (3.56-10.2)	595
Non-Hispanic blacks (2011 - 2012)	1.09 (.915-1.29)	.896 (.750-1.05)	2.31 (1.73-3.33)	7.45 (5.19-10.7)	15.2 (9.60-22.5)	665
Non-Hispanic blacks (2013 - 2014)	*	< LOD	1.78 (1.39-2.37)	5.08 (3.72-6.67)	8.86 (7.29-10.6)	609
Non-Hispanic blacks (2015 - 2016)	*	< LOD	1.30 (<LOD-1.52)	2.82 (1.94-4.92)	5.33 (3.37-10.5)	697
Non-Hispanic whites (2011 - 2012)	*	1.15 (<LOD-1.38)	3.06 (2.35-3.60)	8.23 (5.91-11.9)	20.1 (11.4-33.8)	811
Non-Hispanic whites (2013 - 2014)	*	< LOD	2.37 (2.00-2.67)	5.20 (4.23-6.25)	9.20 (7.50-13.2)	987
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	3.05 (2.46-3.77)	4.92 (3.56-6.85)	862
All Hispanics (2011 - 2012)	*	1.02 (.875-1.20)	2.18 (1.90-2.46)	6.67 (4.00-9.25)	14.9 (10.1-29.7)	571
All Hispanics (2013 - 2014)	*	< LOD	2.00 (1.56-2.79)	5.45 (4.21-8.00)	11.7 (8.00-14.9)	690
All Hispanics (2015 - 2016)	*	< LOD	1.68 (<LOD-2.07)	3.56 (2.80-5.05)	7.11 (4.76-8.56)	971
Asians (2011 - 2012)	*	1.21 (<LOD-1.49)	2.70 (2.00-3.50)	6.75 (4.62-10.1)	14.9 (8.75-21.5)	352
Asians (2013 - 2014)	*	< LOD	2.37 (1.86-3.05)	5.88 (3.56-8.66)	11.4 (7.39-22.2)	288
Asians (2015 - 2016)	*	< LOD	2.10 (<LOD-2.67)	3.70 (2.78-4.79)	5.85 (3.43-13.3)	301

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-oxoisobutyl phthalate (MONP) (2015 – 2016)

CAS Number 297182-83-3

Metabolite of Di-isobutyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	2.12 (1.77-2.54)	1.90 (1.60-2.10)	3.80 (3.20-4.80)	11.3 (7.60-15.7)	21.6 (14.6-34.7)	2970
Age 3-5 years (2015 - 2016)	2.49 (2.05-3.03)	2.20 (1.90-2.60)	4.60 (3.70-5.40)	9.60 (8.10-13.4)	19.7 (11.0-34.7)	465
Age 6-11 years (2015 - 2016)	2.86 (2.43-3.36)	2.60 (2.20-3.20)	4.70 (3.90-6.90)	12.7 (8.80-15.2)	18.4 (13.8-36.3)	413
Age 12-19 years (2015 - 2016)	2.56 (2.00-3.29)	2.20 (1.80-2.70)	4.60 (3.30-6.50)	12.6 (7.70-18.2)	25.1 (12.4-62.7)	403
Age 20+ years (2015 - 2016)	1.98 (1.64-2.40)	1.80 (1.50-2.00)	3.50 (2.90-4.70)	11.0 (7.00-16.4)	21.6 (13.6-35.7)	1689
Males (2015 - 2016)	2.32 (1.89-2.85)	2.00 (1.70-2.40)	4.00 (3.30-5.80)	12.2 (8.20-17.9)	25.7 (14.3-43.4)	1472
Females (2015 - 2016)	1.94 (1.64-2.30)	1.70 (1.50-2.00)	3.60 (3.00-4.50)	10.4 (6.50-15.4)	18.4 (13.6-31.1)	1498
Mexican Americans (2015 - 2016)	2.22 (1.92-2.57)	2.00 (1.70-2.30)	4.00 (3.40-4.80)	10.3 (7.20-13.3)	22.1 (12.2-32.4)	594
Non-Hispanic blacks (2015 - 2016)	2.72 (1.97-3.75)	2.40 (1.80-3.30)	5.20 (3.20-9.20)	14.5 (8.30-22.3)	29.3 (16.4-48.3)	697
Non-Hispanic whites (2015 - 2016)	2.01 (1.66-2.44)	1.80 (1.50-2.10)	3.50 (2.90-4.50)	11.5 (7.00-15.4)	20.9 (13.6-34.7)	861
All Hispanics (2015 - 2016)	2.28 (1.94-2.68)	2.10 (1.80-2.20)	4.30 (3.40-6.00)	11.0 (8.30-15.7)	26.1 (13.3-35.0)	969
Asians (2015 - 2016)	1.81 (1.39-2.35)	1.60 (1.30-1.90)	3.80 (2.50-6.00)	10.1 (5.40-25.0)	25.0 (8.50-95.9)	301

Limit of detection (LOD, see Data Analysis section) for Survey year 15-16 is 0.4.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-oxoisobutyl phthalate (MONP) (creatinine corrected) (2015 – 2016)

CAS Number 297182-83-3

Metabolite of Di-isobutyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	2.19 (1.89-2.54)	1.77 (1.54-2.03)	3.65 (2.99-4.33)	10.3 (7.41-14.4)	19.2 (13.3-27.2)	2969
Age 3-5 years (2015 - 2016)	5.94 (5.02-7.03)	5.15 (4.29-6.25)	9.00 (7.27-11.9)	17.2 (11.9-40.4)	41.6 (22.7-55.6)	464
Age 6-11 years (2015 - 2016)	3.70 (3.22-4.25)	3.20 (2.90-3.64)	5.65 (4.51-7.00)	13.3 (9.00-25.5)	27.8 (14.4-37.9)	413
Age 12-19 years (2015 - 2016)	1.99 (1.63-2.44)	1.61 (1.36-2.00)	3.20 (2.39-4.58)	8.05 (4.78-13.8)	16.2 (8.01-40.5)	403
Age 20+ years (2015 - 2016)	2.02 (1.73-2.36)	1.62 (1.44-1.87)	3.06 (2.50-3.72)	9.44 (6.47-14.4)	18.5 (12.7-25.0)	1689
Males (2015 - 2016)	2.07 (1.72-2.48)	1.59 (1.37-2.00)	3.57 (2.79-4.65)	10.7 (7.27-14.2)	17.4 (12.6-27.1)	1472
Females (2015 - 2016)	2.32 (2.04-2.65)	1.89 (1.69-2.11)	3.67 (3.03-4.41)	9.78 (6.67-15.2)	21.3 (13.8-27.2)	1497
Mexican Americans (2015 - 2016)	2.42 (2.12-2.76)	2.05 (1.79-2.20)	4.00 (3.48-4.89)	10.4 (7.78-14.6)	18.6 (12.4-26.3)	594
Non-Hispanic blacks (2015 - 2016)	2.17 (1.67-2.82)	1.76 (1.41-2.40)	3.93 (2.69-6.65)	10.6 (6.67-14.4)	16.8 (12.0-34.4)	696
Non-Hispanic whites (2015 - 2016)	2.17 (1.87-2.51)	1.72 (1.52-1.92)	3.54 (2.92-4.11)	10.0 (6.67-14.8)	18.8 (11.4-28.1)	861
All Hispanics (2015 - 2016)	2.40 (2.05-2.83)	2.00 (1.78-2.23)	4.19 (3.33-5.31)	11.3 (7.94-15.2)	21.1 (15.0-26.1)	969
Asians (2015 - 2016)	2.24 (1.74-2.87)	1.82 (1.47-2.12)	3.68 (2.64-5.97)	12.5 (6.76-25.0)	27.2 (12.1-50.4)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(carboxyoctyl) phthalate (MCOP) (2005 – 2010)

CAS Number 898544-09-7

Metabolite of Di-isononyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	5.39 (4.68-6.22)	5.10 (4.40-6.00)	10.9 (9.10-13.1)	25.5 (19.1-35.4)	54.4 (32.5-85.2)	2548
Total population (2007 - 2008)	6.79 (5.83-7.92)	6.40 (5.60-7.40)	14.9 (12.1-18.2)	34.6 (25.2-43.8)	63.0 (41.8-80.0)	2604
Total population (2009 - 2010)	12.6 (10.4-15.2)	11.8 (9.26-14.7)	33.1 (25.8-40.2)	83.3 (61.2-113)	160 (117-191)	2749
Age 6-11 years (2005 - 2006)	8.52 (7.19-10.1)	8.90 (7.60-9.90)	15.0 (11.3-19.3)	26.4 (19.9-37.3)	40.3 (26.4-61.6)	356
Age 6-11 years (2007 - 2008)	10.8 (9.25-12.6)	10.7 (9.10-13.1)	19.8 (15.8-24.5)	33.8 (26.1-50.3)	59.9 (33.5-79.5)	389
Age 6-11 years (2009 - 2010)	15.0 (10.8-20.7)	14.2 (9.15-20.7)	34.7 (18.6-56.5)	74.6 (41.6-135)	120 (74.6-340)	415
Age 12-19 years (2005 - 2006)	6.61 (5.42-8.06)	6.30 (5.20-7.30)	11.9 (9.60-16.0)	28.4 (18.2-58.7)	63.2 (28.4-106)	702
Age 12-19 years (2007 - 2008)	9.25 (7.33-11.7)	8.10 (6.80-10.3)	20.8 (15.4-28.7)	60.5 (29.6-79.4)	79.4 (49.7-166)	401
Age 12-19 years (2009 - 2010)	16.1 (12.3-20.9)	14.5 (11.6-17.0)	39.8 (22.5-61.2)	96.8 (66.7-191)	209 (135-263)	420
Age 20+ years (2005 - 2006)	4.96 (4.27-5.76)	4.50 (3.90-5.20)	9.70 (8.20-12.3)	25.1 (18.2-35.7)	54.4 (30.8-88.5)	1490
Age 20+ years (2007 - 2008)	6.15 (5.20-7.29)	5.80 (5.00-6.60)	13.2 (10.5-16.8)	32.0 (23.0-41.8)	61.2 (38.9-80.0)	1814
Age 20+ years (2009 - 2010)	11.9 (9.89-14.3)	11.0 (8.58-13.7)	32.1 (25.8-39.0)	83.7 (56.0-114)	158 (109-188)	1914
Males (2005 - 2006)	6.24 (5.25-7.42)	5.70 (4.70-6.90)	12.1 (10.2-15.1)	30.8 (19.0-58.8)	66.4 (33.8-122)	1270
Males (2007 - 2008)	7.14 (6.10-8.36)	6.60 (5.70-7.70)	15.6 (12.4-19.3)	35.7 (24.7-43.2)	61.2 (40.1-89.1)	1294
Males (2009 - 2010)	14.0 (11.6-16.8)	13.4 (10.5-15.6)	36.0 (27.5-45.9)	92.9 (66.1-134)	168 (111-217)	1399
Females (2005 - 2006)	4.69 (4.14-5.30)	4.50 (4.00-5.20)	9.30 (8.20-11.1)	21.5 (17.5-27.0)	41.7 (28.1-61.7)	1278
Females (2007 - 2008)	6.48 (5.49-7.65)	6.20 (5.40-7.40)	14.3 (12.0-17.0)	32.6 (24.8-47.0)	64.8 (47.0-73.3)	1310
Females (2009 - 2010)	11.4 (9.17-14.1)	10.6 (8.05-13.7)	29.6 (20.8-38.4)	70.4 (50.1-113)	146 (85.2-188)	1350
Mexican Americans (2005 - 2006)	5.77 (4.84-6.87)	5.20 (4.50-5.70)	9.90 (8.50-12.0)	23.6 (14.9-49.7)	54.4 (23.0-185)	637
Mexican Americans (2007 - 2008)	6.83 (6.23-7.49)	6.20 (5.60-6.80)	12.9 (11.3-14.9)	29.1 (25.2-33.8)	52.0 (36.8-61.2)	531
Mexican Americans (2009 - 2010)	9.96 (7.99-12.4)	8.59 (6.21-12.1)	20.3 (15.8-32.6)	59.3 (44.0-69.5)	86.2 (63.2-136)	566
Non-Hispanic blacks (2005 - 2006)	6.08 (5.60-6.61)	6.00 (5.10-6.70)	11.4 (10.4-13.0)	24.5 (20.3-28.1)	50.0 (32.0-70.3)	678
Non-Hispanic blacks (2007 - 2008)	7.55 (6.21-9.17)	7.00 (6.00-8.00)	16.6 (12.0-22.9)	40.3 (25.5-51.9)	60.4 (41.8-97.8)	597
Non-Hispanic blacks (2009 - 2010)	12.6 (9.85-16.1)	11.0 (7.35-16.2)	34.5 (26.5-42.1)	82.4 (63.8-109)	137 (83.3-188)	516
Non-Hispanic whites (2005 - 2006)	5.25 (4.40-6.27)	5.00 (4.10-6.20)	11.1 (8.60-13.6)	25.5 (17.7-43.5)	56.1 (28.1-88.5)	1038
Non-Hispanic whites (2007 - 2008)	6.81 (5.48-8.46)	6.40 (5.20-7.90)	15.1 (11.0-20.8)	35.7 (23.2-62.0)	64.7 (39.4-89.0)	1077
Non-Hispanic whites (2009 - 2010)	13.4 (10.7-16.8)	12.9 (10.1-16.1)	34.8 (27.5-43.4)	88.9 (64.4-136)	168 (113-220)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 05-06, 07-08, and 09-10 are 0.7, 0.7, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(carboxyoctyl) phthalate (MCOP) (2011 – 2016)

CAS Number 898544-09-7

Metabolite of Di-isononyl phthalates (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	19.7 (17.4-22.3)	18.7 (15.6-21.3)	50.0 (43.0-61.8)	123 (98.3-160)	214 (180-275)	2489
Total population (2013 - 2014)	21.3 (19.5-23.3)	19.8 (17.8-21.5)	54.8 (48.1-58.9)	136 (122-159)	247 (213-272)	2685
Total population (2015 - 2016)	8.26 (6.46-10.6)	7.40 (5.70-9.30)	17.5 (12.9-22.7)	47.0 (31.9-74.5)	93.8 (63.8-144)	2975
Age 3-5 years (2015 - 2016)	9.05 (7.37-11.1)	8.00 (6.40-10.0)	15.6 (12.7-22.2)	35.4 (29.4-59.9)	69.2 (35.4-127)	465
Age 6-11 years (2011 - 2012)	18.3 (15.7-21.4)	17.0 (14.7-19.8)	35.2 (30.2-46.4)	88.2 (63.1-108)	144 (90.7-249)	396
Age 6-11 years (2013 - 2014)	27.6 (22.9-33.1)	26.4 (18.7-36.1)	60.8 (51.1-82.1)	150 (110-209)	272 (152-428)	409
Age 6-11 years (2015 - 2016)	11.1 (9.15-13.4)	10.2 (8.50-12.0)	19.9 (15.3-27.4)	51.9 (34.3-71.5)	94.7 (63.3-137)	415
Age 12-19 years (2011 - 2012)	21.7 (17.2-27.3)	20.7 (16.0-25.8)	51.4 (35.9-68.0)	160 (80.4-261)	289 (174-421)	388
Age 12-19 years (2013 - 2014)	28.1 (23.6-33.4)	23.8 (18.7-32.4)	75.7 (54.2-99.3)	167 (137-184)	286 (167-612)	462
Age 12-19 years (2015 - 2016)	10.3 (7.72-13.7)	9.00 (6.50-12.6)	19.4 (15.5-26.7)	55.3 (37.2-101)	120 (54.5-192)	405
Age 20+ years (2011 - 2012)	19.6 (17.0-22.6)	18.6 (14.7-21.5)	51.4 (43.4-66.1)	127 (103-165)	199 (178-273)	1705
Age 20+ years (2013 - 2014)	19.9 (18.1-21.9)	18.2 (16.9-20.4)	50.4 (43.2-56.9)	131 (109-150)	239 (211-260)	1814
Age 20+ years (2015 - 2016)	7.72 (5.95-10.0)	6.90 (5.20-8.50)	16.6 (11.8-22.0)	44.6 (29.1-75.4)	89.3 (54.6-146)	1690
Males (2011 - 2012)	22.8 (19.9-26.1)	20.2 (16.6-22.1)	59.8 (50.0-67.5)	155 (120-184)	255 (184-379)	1259
Males (2013 - 2014)	23.4 (20.5-26.6)	21.0 (18.2-23.4)	57.0 (47.7-70.9)	142 (122-184)	256 (215-293)	1285
Males (2015 - 2016)	9.02 (6.84-11.9)	8.00 (6.10-9.90)	18.5 (13.4-25.6)	51.9 (31.9-84.2)	111 (60.0-192)	1474
Females (2011 - 2012)	17.1 (14.7-19.9)	16.3 (13.5-20.4)	43.3 (35.3-58.6)	103 (75.4-138)	180 (119-259)	1230
Females (2013 - 2014)	19.5 (17.4-21.9)	18.5 (15.8-21.4)	49.1 (41.7-57.1)	128 (108-164)	239 (180-262)	1400
Females (2015 - 2016)	7.58 (5.98-9.62)	6.90 (5.30-8.50)	15.9 (11.7-22.2)	40.5 (31.3-71.5)	86.1 (53.5-125)	1501
Mexican Americans (2011 - 2012)	17.1 (14.8-19.9)	14.4 (11.5-20.5)	38.1 (33.9-46.6)	96.7 (70.3-133)	174 (98.9-251)	316
Mexican Americans (2013 - 2014)	17.7 (15.2-20.6)	15.7 (11.6-22.1)	39.9 (27.4-53.1)	100 (63.2-117)	131 (115-184)	438
Mexican Americans (2015 - 2016)	9.29 (7.73-11.2)	8.10 (6.90-10.2)	16.6 (12.7-25.9)	49.2 (37.1-59.8)	103 (64.2-126)	595
Non-Hispanic blacks (2011 - 2012)	24.1 (21.0-27.5)	22.4 (19.0-25.1)	58.2 (45.7-75.9)	165 (102-220)	273 (206-306)	665
Non-Hispanic blacks (2013 - 2014)	22.0 (18.9-25.5)	20.4 (16.9-24.1)	51.4 (41.6-59.6)	126 (80.9-158)	208 (136-322)	609
Non-Hispanic blacks (2015 - 2016)	9.66 (6.35-14.7)	8.50 (5.70-13.5)	20.5 (10.7-47.3)	64.9 (26.9-118)	108 (75.2-146)	698
Non-Hispanic whites (2011 - 2012)	20.1 (17.2-23.4)	19.5 (15.6-21.8)	52.8 (43.1-68.0)	123 (94.0-166)	196 (166-275)	813
Non-Hispanic whites (2013 - 2014)	22.0 (19.6-24.8)	20.6 (17.7-22.8)	56.9 (47.9-66.8)	144 (122-180)	251 (211-272)	987
Non-Hispanic whites (2015 - 2016)	7.95 (6.15-10.3)	7.20 (5.50-8.90)	16.9 (12.1-21.4)	41.8 (29.7-75.3)	89.3 (50.7-159)	862
All Hispanics (2011 - 2012)	18.5 (15.3-22.2)	15.8 (11.9-21.1)	42.3 (35.3-55.1)	104 (77.9-153)	221 (133-297)	571
All Hispanics (2013 - 2014)	20.0 (17.2-23.2)	18.0 (13.7-23.5)	49.4 (39.1-57.1)	115 (79.7-147)	200 (139-293)	690
All Hispanics (2015 - 2016)	9.72 (7.91-12.0)	8.60 (6.80-11.0)	19.7 (14.5-26.5)	53.8 (38.0-73.6)	103 (67.7-128)	971
Asians (2011 - 2012)	12.2 (10.0-14.8)	11.0 (8.40-13.8)	36.7 (25.6-47.1)	81.9 (66.1-127)	135 (91.9-204)	352
Asians (2013 - 2014)	14.9 (11.5-19.3)	12.6 (9.80-19.7)	43.7 (35.6-52.6)	140 (71.3-183)	193 (156-287)	289
Asians (2015 - 2016)	5.91 (4.26-8.18)	5.20 (4.30-7.10)	13.6 (9.50-24.3)	43.1 (24.3-74.8)	74.8 (32.2-386)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.2, 0.3, and 0.3, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(carboxyoctyl) phthalate (MCOP) (creatinine corrected) (2005 – 2010)

CAS Number 898544-09-7

Metabolite of Di-isononyl phthalate (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	5.26 (4.54-6.10)	4.53 (3.95-5.11)	9.25 (7.64-11.2)	24.0 (17.1-30.8)	40.2 (30.3-55.2)	2548
Total population (2007 - 2008)	6.85 (6.05-7.75)	5.94 (5.19-6.67)	12.6 (10.8-14.4)	30.6 (23.4-38.5)	50.2 (40.0-60.0)	2604
Total population (2009 - 2010)	13.1 (11.1-15.5)	11.6 (9.69-13.8)	29.3 (23.7-36.2)	72.3 (55.0-93.8)	119 (89.1-147)	2749
Age 6-11 years (2005 - 2006)	9.38 (8.08-10.9)	8.48 (7.66-10.1)	14.8 (12.2-18.7)	30.3 (20.0-38.8)	40.1 (28.2-57.3)	356
Age 6-11 years (2007 - 2008)	13.3 (11.4-15.5)	11.6 (9.90-14.2)	23.1 (16.2-32.5)	44.2 (27.0-64.1)	60.3 (44.2-110)	389
Age 6-11 years (2009 - 2010)	19.5 (14.7-25.9)	18.6 (11.7-26.9)	35.9 (25.7-56.9)	87.8 (43.7-132)	139 (80.1-312)	415
Age 12-19 years (2005 - 2006)	4.93 (4.10-5.93)	4.32 (3.61-4.89)	7.44 (5.93-11.0)	19.4 (12.4-31.8)	34.7 (24.1-58.3)	702
Age 12-19 years (2007 - 2008)	7.20 (5.94-8.73)	6.28 (4.79-8.08)	12.6 (10.0-20.7)	32.7 (22.6-56.9)	56.9 (31.4-103)	401
Age 12-19 years (2009 - 2010)	12.9 (10.5-15.8)	11.5 (8.38-15.1)	26.3 (19.2-37.9)	74.8 (43.5-120)	125 (101-167)	420
Age 20+ years (2005 - 2006)	4.97 (4.26-5.81)	4.17 (3.68-4.77)	8.58 (7.23-10.6)	23.4 (15.5-31.8)	41.1 (29.2-55.9)	1490
Age 20+ years (2007 - 2008)	6.32 (5.49-7.27)	5.31 (4.77-6.05)	11.8 (9.27-13.9)	27.5 (19.5-36.8)	47.7 (34.4-60.9)	1814
Age 20+ years (2009 - 2010)	12.6 (10.7-14.8)	10.9 (9.42-12.7)	28.5 (23.3-35.9)	69.5 (52.5-89.4)	113 (81.9-153)	1914
Males (2005 - 2006)	5.01 (4.21-5.97)	4.29 (3.75-5.03)	8.44 (7.17-10.9)	21.6 (15.1-35.4)	44.6 (25.7-85.9)	1270
Males (2007 - 2008)	6.01 (5.29-6.84)	5.14 (4.54-6.26)	11.5 (9.32-13.6)	24.5 (19.2-31.0)	43.2 (31.2-54.9)	1294
Males (2009 - 2010)	12.5 (10.6-14.7)	11.4 (9.29-13.9)	28.6 (23.5-36.6)	67.2 (52.0-85.9)	106 (82.2-138)	1399
Females (2005 - 2006)	5.51 (4.75-6.39)	4.73 (4.23-5.32)	9.55 (8.26-12.2)	24.7 (17.3-30.3)	39.3 (30.3-45.0)	1278
Females (2007 - 2008)	7.76 (6.84-8.81)	6.52 (5.95-7.39)	13.7 (11.9-16.5)	35.3 (26.6-44.2)	57.7 (43.5-74.4)	1310
Females (2009 - 2010)	13.7 (11.5-16.4)	11.8 (9.80-14.4)	29.5 (22.8-37.9)	75.3 (54.2-110)	123 (93.8-197)	1350
Mexican Americans (2005 - 2006)	5.19 (4.38-6.14)	4.50 (3.64-5.29)	8.04 (7.13-10.1)	19.5 (12.3-37.7)	43.6 (20.9-93.4)	637
Mexican Americans (2007 - 2008)	6.66 (5.97-7.44)	5.29 (4.69-6.20)	11.6 (10.4-13.0)	25.7 (20.9-29.8)	38.3 (30.8-58.3)	531
Mexican Americans (2009 - 2010)	9.89 (7.75-12.6)	8.53 (6.98-10.0)	20.9 (12.8-28.3)	51.6 (34.2-72.3)	89.4 (59.3-125)	566
Non-Hispanic blacks (2005 - 2006)	4.28 (3.86-4.74)	3.67 (3.26-4.09)	7.60 (6.80-8.81)	17.1 (13.2-21.5)	31.8 (22.5-43.7)	678
Non-Hispanic blacks (2007 - 2008)	5.87 (4.82-7.13)	5.37 (4.16-6.50)	11.1 (8.68-15.2)	28.1 (17.7-37.2)	40.2 (32.0-57.8)	597
Non-Hispanic blacks (2009 - 2010)	9.11 (7.52-11.0)	7.62 (5.84-10.8)	19.8 (15.5-26.5)	47.6 (36.9-57.7)	77.8 (57.0-104)	516
Non-Hispanic whites (2005 - 2006)	5.53 (4.61-6.63)	4.81 (4.13-5.56)	10.0 (7.63-13.3)	25.2 (16.3-34.5)	39.3 (26.8-59.7)	1038
Non-Hispanic whites (2007 - 2008)	7.11 (5.91-8.56)	6.27 (5.09-7.50)	13.0 (10.4-16.3)	31.1 (21.3-43.2)	54.2 (40.2-64.1)	1077
Non-Hispanic whites (2009 - 2010)	15.1 (12.6-18.1)	13.5 (11.3-16.4)	33.6 (27.0-43.5)	79.2 (60.0-106)	126 (97.9-186)	1206

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(carboxyoctyl) phthalate (MCOP) (creatinine corrected) (2011 – 2016)

CAS Number 898544-09-7

Metabolite of Di-isononyl phthalates (DiNP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	22.4 (19.4-25.8)	20.4 (17.0-24.4)	54.1 (42.0-62.1)	118 (92.5-144)	194 (144-239)	2487
Total population (2013 - 2014)	21.4 (19.8-23.1)	19.5 (16.9-22.6)	46.5 (41.9-51.1)	123 (98.0-134)	196 (162-240)	2684
Total population (2015 - 2016)	8.55 (6.88-10.6)	6.89 (5.61-8.76)	17.2 (12.8-23.0)	43.3 (31.5-62.3)	75.2 (53.3-102)	2974
Age 3-5 years (2015 - 2016)	21.6 (18.1-25.8)	18.2 (15.2-21.2)	35.3 (24.5-46.7)	75.6 (45.7-151)	151 (85.9-210)	464
Age 6-11 years (2011 - 2012)	25.9 (22.8-29.6)	22.1 (18.7-25.8)	42.3 (32.7-54.2)	116 (56.9-161)	161 (117-259)	395
Age 6-11 years (2013 - 2014)	34.8 (29.6-40.9)	33.1 (24.4-42.8)	71.4 (51.4-94.7)	176 (104-254)	278 (176-412)	409
Age 6-11 years (2015 - 2016)	14.3 (12.0-16.9)	11.5 (9.60-14.3)	23.1 (17.5-33.3)	59.6 (39.6-90.4)	107 (66.9-140)	415
Age 12-19 years (2011 - 2012)	21.1 (16.6-26.9)	16.9 (13.7-20.2)	45.6 (28.8-63.4)	120 (73.7-209)	238 (117-396)	388
Age 12-19 years (2013 - 2014)	22.8 (19.2-27.1)	21.7 (15.0-26.8)	50.8 (39.5-63.2)	140 (95.5-193)	208 (160-300)	462
Age 12-19 years (2015 - 2016)	7.99 (6.21-10.3)	6.27 (4.41-9.13)	16.4 (10.4-19.4)	40.7 (25.7-55.5)	70.2 (41.7-116)	405
Age 20+ years (2011 - 2012)	22.2 (19.1-25.8)	20.8 (16.7-25.1)	55.3 (42.0-64.5)	118 (92.2-144)	194 (136-250)	1704
Age 20+ years (2013 - 2014)	20.1 (18.6-21.7)	18.3 (15.9-21.3)	43.2 (38.6-48.5)	111 (87.8-127)	181 (148-218)	1813
Age 20+ years (2015 - 2016)	7.87 (6.26-9.90)	6.42 (4.88-7.87)	15.3 (10.6-22.1)	39.7 (28.6-62.5)	71.5 (49.4-96.1)	1690
Males (2011 - 2012)	21.3 (18.9-23.9)	20.0 (16.1-23.2)	54.2 (45.8-58.8)	112 (90.3-144)	189 (136-222)	1258
Males (2013 - 2014)	19.6 (17.7-21.8)	17.9 (15.1-21.9)	42.4 (37.0-51.2)	111 (86.6-125)	192 (133-245)	1284
Males (2015 - 2016)	8.05 (6.27-10.3)	6.68 (4.76-9.00)	16.5 (11.6-22.3)	44.7 (29.0-64.4)	75.1 (48.7-97.3)	1474
Females (2011 - 2012)	23.5 (19.4-28.5)	20.8 (16.6-26.2)	53.7 (38.3-68.5)	121 (86.8-156)	194 (135-290)	1229
Females (2013 - 2014)	23.2 (20.3-26.5)	20.9 (17.4-24.1)	49.5 (42.5-60.8)	130 (95.7-166)	201 (164-268)	1400
Females (2015 - 2016)	9.06 (7.39-11.1)	7.17 (6.00-8.95)	17.8 (13.1-23.4)	42.6 (30.2-67.4)	75.2 (52.9-118)	1500
Mexican Americans (2011 - 2012)	19.3 (16.8-22.2)	16.3 (12.8-20.7)	35.7 (26.8-55.5)	81.9 (70.6-115)	136 (81.1-384)	316
Mexican Americans (2013 - 2014)	18.0 (14.7-22.1)	16.1 (12.4-22.6)	36.7 (29.3-45.7)	67.4 (53.3-108)	119 (81.4-152)	438
Mexican Americans (2015 - 2016)	10.1 (8.48-12.1)	8.29 (6.98-10.5)	19.4 (15.0-25.4)	42.4 (35.1-62.3)	79.3 (60.5-90.6)	595
Non-Hispanic blacks (2011 - 2012)	18.7 (16.5-21.3)	16.1 (14.1-19.6)	40.0 (32.6-51.6)	102 (76.4-134)	154 (132-201)	665
Non-Hispanic blacks (2013 - 2014)	16.2 (14.3-18.3)	14.3 (12.2-16.7)	36.6 (29.3-44.0)	86.6 (73.2-104)	128 (107-156)	609
Non-Hispanic blacks (2015 - 2016)	7.70 (5.36-11.0)	6.33 (4.54-9.36)	15.3 (8.40-29.7)	46.0 (24.5-77.0)	77.0 (55.0-100)	697
Non-Hispanic whites (2011 - 2012)	24.3 (20.4-29.0)	21.9 (18.1-27.5)	58.8 (48.3-71.3)	127 (101-161)	203 (146-284)	811
Non-Hispanic whites (2013 - 2014)	23.2 (21.0-25.7)	22.0 (17.7-24.8)	50.0 (42.3-58.2)	127 (99.4-159)	205 (160-276)	987
Non-Hispanic whites (2015 - 2016)	8.55 (6.89-10.6)	6.78 (5.49-8.66)	16.6 (12.7-22.9)	42.6 (30.0-63.3)	75.2 (49.0-118)	862
All Hispanics (2011 - 2012)	20.7 (18.0-23.7)	18.3 (15.5-21.7)	38.7 (31.2-53.0)	90.7 (79.3-117)	163 (121-276)	571
All Hispanics (2013 - 2014)	19.8 (16.9-23.3)	18.1 (14.6-21.7)	42.6 (36.6-47.2)	87.8 (65.5-119)	186 (115-240)	690
All Hispanics (2015 - 2016)	10.2 (8.32-12.6)	8.24 (6.84-11.0)	20.1 (15.8-26.3)	48.8 (35.0-67.2)	80.1 (60.5-103)	971
Asians (2011 - 2012)	16.3 (13.7-19.4)	16.5 (11.5-22.3)	37.5 (31.5-51.3)	71.8 (58.5-110)	121 (77.5-172)	352
Asians (2013 - 2014)	18.8 (15.1-23.4)	17.0 (11.5-23.1)	46.0 (34.8-67.3)	167 (81.3-215)	230 (172-383)	288
Asians (2015 - 2016)	7.31 (5.59-9.56)	5.60 (4.36-7.62)	19.1 (10.4-24.9)	39.4 (25.9-56.6)	92.5 (38.9-156)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DiNP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-methyl phthalate (MMP) (2001 – 2010)

CAS Number 4376-18-5

Metabolite of Dimethyl phthalate (DMP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	1.15 (.985-1.34)	1.50 (1.30-1.80)	3.30 (2.90-3.70)	6.00 (5.10-7.50)	9.80 (8.00-12.5)	2782
Total population (2003 - 2004)	*	1.30 (<LOD-1.70)	3.90 (3.00-4.90)	9.70 (7.70-12.2)	16.3 (12.0-20.4)	2605
Total population (2005 - 2006)	*	< LOD	2.50 (1.90-3.40)	7.40 (6.10-8.60)	12.4 (10.8-14.7)	2548
Total population (2007 - 2008)	*	< LOD	2.20 (1.80-2.70)	6.50 (4.70-8.30)	11.3 (8.40-16.3)	2604
Total population (2009 - 2010)	*	.940 (.670-1.21)	2.89 (2.51-3.28)	6.72 (5.76-8.16)	12.0 (9.29-15.3)	2749
Age 6-11 years (2001 - 2002)	1.45 (1.13-1.87)	1.90 (1.40-2.80)	4.00 (3.40-4.90)	7.20 (6.00-8.00)	11.8 (7.60-20.8)	393
Age 6-11 years (2003 - 2004)	2.10 (1.67-2.63)	1.70 (1.20-2.40)	4.30 (2.80-6.40)	9.50 (6.40-18.8)	18.8 (9.40-33.4)	342
Age 6-11 years (2005 - 2006)	*	< LOD	4.00 (3.30-4.80)	10.6 (7.40-13.4)	15.4 (10.6-30.6)	356
Age 6-11 years (2007 - 2008)	*	1.20 (<LOD-1.60)	3.70 (3.00-5.30)	8.00 (6.50-8.70)	12.1 (8.30-35.8)	389
Age 6-11 years (2009 - 2010)	2.13 (1.83-2.47)	2.36 (1.72-2.92)	4.83 (3.85-5.61)	10.8 (8.59-16.7)	22.3 (11.4-25.8)	415
Age 12-19 years (2001 - 2002)	1.59 (1.28-1.96)	2.10 (1.80-2.50)	3.90 (3.30-4.70)	8.50 (5.30-10.5)	13.0 (9.60-17.8)	742
Age 12-19 years (2003 - 2004)	*	1.50 (1.00-2.20)	4.40 (3.00-7.00)	13.3 (7.40-20.9)	21.8 (17.8-31.5)	729
Age 12-19 years (2005 - 2006)	*	< LOD	3.70 (2.70-4.60)	8.60 (7.00-9.50)	12.4 (9.30-20.7)	702
Age 12-19 years (2007 - 2008)	*	< LOD	2.30 (1.70-3.20)	6.70 (4.20-8.90)	12.0 (7.90-17.4)	401
Age 12-19 years (2009 - 2010)	1.45 (1.12-1.89)	1.37 (.870-1.98)	3.33 (2.76-4.53)	7.68 (5.27-11.7)	12.0 (7.33-19.6)	420
Age 20+ years (2001 - 2002)	1.06 (.904-1.25)	1.40 (1.10-1.60)	3.10 (2.50-3.50)	5.60 (4.60-7.10)	9.20 (7.40-12.3)	1647
Age 20+ years (2003 - 2004)	*	1.20 (<LOD-1.50)	3.80 (2.80-4.90)	9.30 (7.10-11.8)	14.3 (10.8-19.9)	1534
Age 20+ years (2005 - 2006)	*	< LOD	2.20 (1.60-2.80)	6.90 (5.30-8.40)	11.9 (9.50-14.7)	1490
Age 20+ years (2007 - 2008)	*	< LOD	2.00 (1.60-2.50)	6.00 (4.20-8.30)	11.1 (8.10-17.3)	1814
Age 20+ years (2009 - 2010)	*	.750 (<LOD-1.02)	2.59 (2.19-2.90)	6.30 (5.22-7.60)	10.5 (8.49-14.2)	1914
Males (2001 - 2002)	1.17 (.962-1.43)	1.50 (1.30-1.90)	3.30 (2.90-4.00)	5.90 (4.80-7.90)	9.20 (7.10-13.5)	1371
Males (2003 - 2004)	*	1.30 (1.00-1.80)	4.00 (3.20-5.20)	10.0 (7.30-13.5)	17.7 (11.8-20.4)	1250
Males (2005 - 2006)	*	< LOD	2.40 (1.80-3.50)	7.40 (5.70-9.20)	13.4 (11.0-15.7)	1270
Males (2007 - 2008)	*	< LOD	2.40 (1.80-3.20)	6.90 (4.70-8.70)	10.3 (8.20-17.2)	1294
Males (2009 - 2010)	*	1.04 (.730-1.40)	2.92 (2.60-3.47)	6.53 (5.38-8.66)	11.4 (8.86-13.9)	1399
Females (2001 - 2002)	1.13 (.973-1.31)	1.40 (1.10-1.70)	3.30 (2.80-3.70)	6.40 (5.00-7.80)	10.3 (8.20-16.2)	1411
Females (2003 - 2004)	*	1.20 (<LOD-1.60)	3.60 (2.80-4.70)	9.50 (7.70-12.2)	15.3 (11.7-22.9)	1355
Females (2005 - 2006)	*	< LOD	2.60 (1.80-3.40)	7.40 (5.10-9.30)	12.0 (9.30-16.0)	1278
Females (2007 - 2008)	*	< LOD	2.10 (1.70-2.50)	6.20 (4.30-8.20)	12.0 (7.90-16.1)	1310
Females (2009 - 2010)	*	.840 (.600-1.09)	2.81 (2.30-3.25)	6.81 (5.49-8.27)	13.5 (8.91-16.8)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.2, 1.0, 1.1, 1.1, and 0.5 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DMP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-methyl phthalate (MMP) (2001 – 2010)

CAS Number 4376-18-5

Metabolite of Dimethyl phthalate (DMP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	1.21 (1.02-1.45)	1.60 (1.30-1.70)	3.30 (2.70-4.00)	5.60 (4.70-7.30)	8.60 (6.40-15.2)	677
Mexican Americans (2003 - 2004)	*	1.40 (1.10-1.80)	4.00 (2.50-6.30)	9.60 (7.30-13.4)	15.0 (11.4-18.8)	652
Mexican Americans (2005 - 2006)	*	< LOD	3.10 (2.20-4.30)	7.30 (5.90-9.40)	11.3 (8.50-18.0)	637
Mexican Americans (2007 - 2008)	*	< LOD	2.50 (1.30-3.70)	6.40 (4.20-11.1)	12.1 (6.80-16.3)	531
Mexican Americans (2009 - 2010)	1.36 (1.22-1.51)	1.26 (.970-1.53)	3.67 (2.97-4.16)	8.30 (6.51-9.24)	12.0 (9.36-18.2)	566
Non-Hispanic blacks (2001 - 2002)	1.64 (1.37-1.98)	2.10 (1.70-2.70)	4.40 (3.60-5.10)	8.30 (6.20-10.1)	11.0 (9.50-13.4)	703
Non-Hispanic blacks (2003 - 2004)	2.16 (1.64-2.84)	1.70 (1.00-2.80)	5.10 (3.70-7.00)	11.4 (7.30-17.3)	17.8 (10.2-39.4)	699
Non-Hispanic blacks (2005 - 2006)	*	< LOD	3.70 (2.40-4.70)	8.20 (6.10-10.6)	13.0 (10.6-15.8)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	2.40 (1.50-3.40)	6.10 (4.10-8.80)	10.6 (6.70-16.4)	597
Non-Hispanic blacks (2009 - 2010)	1.71 (1.32-2.21)	1.89 (1.33-2.66)	4.11 (3.38-5.12)	7.87 (5.90-12.5)	14.2 (8.47-17.0)	516
Non-Hispanic whites (2001 - 2002)	1.08 (.906-1.29)	1.40 (1.10-1.70)	3.20 (2.50-3.60)	5.60 (4.70-6.70)	9.70 (7.10-14.0)	1216
Non-Hispanic whites (2003 - 2004)	*	1.20 (<LOD-1.60)	3.60 (2.80-4.80)	9.70 (7.50-12.2)	16.5 (12.0-20.4)	1088
Non-Hispanic whites (2005 - 2006)	*	< LOD	2.30 (1.70-2.80)	7.40 (5.50-8.80)	12.5 (10.4-15.0)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	2.10 (1.70-2.60)	6.80 (4.30-8.50)	11.2 (8.00-18.7)	1077
Non-Hispanic whites (2009 - 2010)	*	.690 (<LOD-.930)	2.37 (1.95-2.85)	6.17 (5.23-8.04)	12.3 (8.97-15.9)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06,07-08, and 09-10 are 0.2, 1.0, 1.1,1.1, and 0.5 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DMP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-methyl phthalate (MMP) (2011 – 2012)‡

CAS Number 4376-18-5

Metabolite of Dimethyl phthalate (DMP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	1.00 (.800-1.20)	3.00 (2.60-3.50)	7.00 (6.30-8.10)	11.8 (10.3-14.8)	2489
Age 6-11 years (2011 - 2012)	2.33 (1.78-3.04)	2.20 (1.50-3.30)	6.40 (5.70-7.70)	15.6 (9.60-24.1)	27.7 (14.8-157)	396
Age 12-19 years (2011 - 2012)	1.41 (1.09-1.81)	1.10 (.800-1.70)	3.80 (2.20-6.00)	9.90 (5.90-14.0)	14.8 (10.4-28.4)	388
Age 20+ years (2011 - 2012)	*	.800 (.600-1.10)	2.60 (2.30-2.90)	6.10 (4.90-6.90)	9.80 (8.60-11.7)	1705
Males (2011 - 2012)	1.34 (1.16-1.55)	1.20 (.900-1.60)	3.40 (2.80-4.10)	8.50 (6.90-9.10)	12.9 (10.1-18.6)	1259
Females (2011 - 2012)	*	.800 (.600-.900)	2.50 (2.20-2.90)	6.30 (5.00-7.30)	10.5 (8.80-13.6)	1230
Mexican Americans (2011 - 2012)	1.39 (1.10-1.76)	1.40 (1.00-1.80)	3.80 (2.50-5.40)	6.90 (5.00-9.40)	9.60 (6.90-14.5)	316
Non-Hispanic blacks (2011 - 2012)	1.51 (1.30-1.77)	1.40 (1.10-1.60)	4.30 (3.10-5.20)	8.90 (6.80-13.0)	16.6 (9.90-24.8)	665
Non-Hispanic whites (2011 - 2012)	*	.700 (<LOD-1.10)	2.50 (2.00-3.10)	6.30 (4.80-8.20)	10.7 (8.90-16.0)	813
All Hispanics (2011 - 2012)	1.54 (1.27-1.87)	1.50 (1.20-1.90)	4.00 (2.90-5.70)	8.00 (5.90-10.7)	11.4 (9.40-14.8)	571
Asians (2011 - 2012)	1.33 (1.13-1.57)	1.20 (.800-1.60)	3.50 (2.90-4.20)	7.50 (5.20-10.6)	14.1 (9.00-20.1)	352

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DMP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-methyl phthalate (MMP) (creatinine corrected) (2001 – 2010)

CAS Number 4376-18-5

Metabolite of Dimethyl phthalate (DMP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	1.08 (.936-1.25)	1.33 (1.13-1.55)	2.62 (2.36-2.97)	5.00 (3.97-6.02)	8.00 (6.07-11.0)	2782
Total population (2003 - 2004)	*	1.53 (<LOD-1.79)	3.45 (2.76-4.37)	7.95 (5.83-11.8)	13.5 (11.3-18.1)	2605
Total population (2005 - 2006)	*	< LOD	2.85 (2.52-3.25)	6.53 (5.49-7.67)	12.2 (9.74-14.3)	2548
Total population (2007 - 2008)	*	< LOD	2.79 (2.31-3.25)	5.68 (4.77-7.36)	10.8 (8.00-13.6)	2604
Total population (2009 - 2010)	*	1.18 (1.03-1.38)	2.56 (2.29-2.92)	5.55 (4.81-6.54)	10.6 (7.70-13.1)	2749
Age 6-11 years (2001 - 2002)	1.65 (1.28-2.14)	2.32 (1.72-2.86)	3.97 (3.27-4.71)	7.20 (5.99-9.41)	13.2 (7.60-22.5)	393
Age 6-11 years (2003 - 2004)	2.22 (1.75-2.81)	1.88 (1.49-2.60)	4.96 (2.81-6.49)	9.67 (6.15-14.6)	16.2 (12.1-34.5)	342
Age 6-11 years (2005 - 2006)	*	< LOD	4.59 (3.09-6.35)	11.0 (8.07-15.0)	18.6 (10.4-21.9)	356
Age 6-11 years (2007 - 2008)	*	2.05 (<LOD-2.33)	4.56 (3.85-5.36)	9.06 (6.63-11.4)	13.6 (10.4-36.0)	389
Age 6-11 years (2009 - 2010)	2.77 (2.44-3.15)	2.85 (2.46-3.29)	5.24 (4.34-6.18)	14.7 (9.87-16.6)	20.5 (14.7-27.7)	415
Age 12-19 years (2001 - 2002)	1.23 (1.01-1.48)	1.51 (1.32-1.82)	2.84 (2.52-3.33)	5.36 (3.68-6.39)	7.27 (5.64-11.4)	742
Age 12-19 years (2003 - 2004)	*	1.34 (1.12-1.73)	3.19 (2.26-4.43)	7.84 (4.95-12.1)	13.3 (9.49-19.1)	729
Age 12-19 years (2005 - 2006)	*	< LOD	2.80 (2.15-3.55)	5.65 (4.33-6.52)	12.4 (6.45-18.9)	702
Age 12-19 years (2007 - 2008)	*	< LOD	2.00 (1.63-2.63)	4.32 (3.10-6.05)	7.25 (4.77-10.8)	401
Age 12-19 years (2009 - 2010)	1.17 (.907-1.51)	1.18 (.930-1.49)	2.24 (1.81-2.62)	4.17 (3.09-6.47)	7.33 (4.56-15.9)	420
Age 20+ years (2001 - 2002)	1.00 (.868-1.16)	1.21 (1.05-1.40)	2.44 (2.14-2.68)	4.53 (3.49-6.02)	7.72 (5.52-11.4)	1647
Age 20+ years (2003 - 2004)	*	1.52 (<LOD-1.79)	3.39 (2.69-4.31)	7.69 (5.40-11.8)	13.3 (10.1-18.9)	1534
Age 20+ years (2005 - 2006)	*	< LOD	2.76 (2.44-3.12)	6.09 (5.00-7.75)	11.2 (9.17-13.4)	1490
Age 20+ years (2007 - 2008)	*	< LOD	2.75 (2.26-3.25)	5.58 (4.33-7.59)	10.4 (7.09-14.8)	1814
Age 20+ years (2009 - 2010)	*	1.09 (<LOD-1.23)	2.34 (2.02-2.69)	5.16 (4.25-6.39)	9.53 (7.07-12.1)	1914
Males (2001 - 2002)	.954 (.794-1.15)	1.17 (1.02-1.40)	2.37 (2.03-2.75)	4.18 (3.45-5.64)	6.42 (4.94-9.59)	1371
Males (2003 - 2004)	*	1.35 (1.15-1.52)	2.95 (2.26-4.09)	7.11 (5.00-10.2)	11.8 (9.05-13.3)	1250
Males (2005 - 2006)	*	< LOD	2.19 (1.89-2.50)	5.03 (4.09-6.45)	10.2 (7.75-13.4)	1270
Males (2007 - 2008)	*	< LOD	2.33 (1.92-2.88)	4.88 (3.85-7.25)	8.56 (6.25-13.8)	1294
Males (2009 - 2010)	*	1.02 (.850-1.21)	2.49 (2.00-2.86)	5.23 (4.25-6.84)	9.51 (7.20-12.4)	1399
Females (2001 - 2002)	1.21 (1.06-1.38)	1.45 (1.23-1.82)	2.87 (2.58-3.06)	5.56 (4.55-7.14)	10.0 (7.20-15.3)	1411
Females (2003 - 2004)	*	1.83 (<LOD-2.10)	3.87 (3.04-4.96)	9.41 (6.41-13.6)	16.5 (12.5-23.5)	1355
Females (2005 - 2006)	*	< LOD	3.47 (3.00-4.11)	7.67 (6.00-9.75)	13.2 (9.75-18.7)	1278
Females (2007 - 2008)	*	< LOD	3.12 (2.72-3.71)	6.50 (5.20-8.67)	11.7 (8.56-14.8)	1310
Females (2009 - 2010)	*	1.35 (1.16-1.57)	2.76 (2.34-3.18)	5.77 (4.94-7.22)	11.3 (8.29-15.5)	1350

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DMP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-methyl phthalate (MMP) (creatinine corrected) (2001 – 2010)

CAS Number 4376-18-5

Metabolite of Dimethyl phthalate (DMP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	1.14 (.975-1.34)	1.48 (1.30-1.63)	2.50 (2.20-2.94)	4.19 (3.77-5.76)	8.47 (5.58-12.5)	677
Mexican Americans (2003 - 2004)	*	1.36 (1.15-1.71)	3.56 (2.45-4.90)	7.53 (5.62-9.64)	12.5 (9.44-16.9)	652
Mexican Americans (2005 - 2006)	*	< LOD	2.86 (2.07-3.67)	6.48 (4.21-8.24)	11.5 (6.94-21.7)	637
Mexican Americans (2007 - 2008)	*	< LOD	2.59 (2.06-3.39)	5.65 (3.60-8.13)	9.40 (6.06-13.9)	531
Mexican Americans (2009 - 2010)	1.35 (1.19-1.53)	1.37 (1.13-1.67)	3.13 (2.61-3.57)	6.18 (5.33-8.40)	10.7 (8.33-15.2)	566
Non-Hispanic blacks (2001 - 2002)	1.15 (.949-1.40)	1.39 (1.29-1.67)	2.70 (2.36-2.95)	4.87 (4.21-5.93)	8.09 (5.86-11.0)	703
Non-Hispanic blacks (2003 - 2004)	1.53 (1.21-1.94)	1.40 (1.07-1.75)	3.14 (2.26-4.37)	7.50 (4.29-14.6)	13.7 (7.70-20.7)	699
Non-Hispanic blacks (2005 - 2006)	*	< LOD	2.59 (1.87-3.28)	5.20 (4.53-6.29)	8.50 (6.79-10.3)	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	2.10 (1.69-2.44)	4.22 (2.94-5.74)	7.36 (4.88-8.79)	597
Non-Hispanic blacks (2009 - 2010)	1.24 (.983-1.56)	1.35 (1.08-1.58)	2.69 (2.22-3.23)	4.94 (4.03-6.54)	8.18 (5.74-15.5)	516
Non-Hispanic whites (2001 - 2002)	1.07 (.914-1.26)	1.30 (1.05-1.58)	2.62 (2.32-2.99)	5.22 (3.68-6.82)	8.26 (6.07-12.6)	1216
Non-Hispanic whites (2003 - 2004)	*	1.56 (<LOD-1.89)	3.50 (2.71-4.67)	8.10 (6.00-11.9)	13.6 (11.3-18.9)	1088
Non-Hispanic whites (2005 - 2006)	*	< LOD	2.98 (2.60-3.39)	7.19 (5.58-9.51)	13.4 (10.4-16.6)	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	2.89 (2.26-3.67)	6.01 (4.63-8.57)	11.7 (7.47-15.6)	1077
Non-Hispanic whites (2009 - 2010)	*	1.13 (<LOD-1.29)	2.48 (2.06-2.80)	5.38 (4.44-6.76)	10.9 (7.68-13.8)	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DMP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-methyl phthalate (MMP) (creatinine corrected) (2011 – 2012)‡

CAS Number 4376-18-5

Metabolite of Dimethyl phthalate (DMP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	1.32 (1.16-1.49)	2.84 (2.52-3.24)	6.13 (5.42-7.43)	11.0 (9.44-12.9)	2487
Age 6-11 years (2011 - 2012)	3.31 (2.57-4.25)	2.97 (2.14-3.89)	7.73 (5.56-8.53)	17.3 (12.4-24.2)	30.2 (17.3-171)	395
Age 12-19 years (2011 - 2012)	1.37 (1.12-1.68)	1.16 (.959-1.46)	2.86 (1.88-4.29)	7.68 (4.95-10.0)	12.2 (7.68-24.6)	388
Age 20+ years (2011 - 2012)	*	1.26 (1.05-1.40)	2.57 (2.33-2.82)	5.29 (4.43-5.93)	9.31 (7.26-10.2)	1704
Males (2011 - 2012)	1.25 (1.09-1.44)	1.23 (.957-1.49)	2.74 (2.35-3.16)	5.88 (5.08-7.73)	10.0 (8.33-12.9)	1258
Females (2011 - 2012)	*	1.38 (1.23-1.52)	2.92 (2.57-3.29)	6.17 (5.44-8.08)	12.2 (8.98-15.4)	1229
Mexican Americans (2011 - 2012)	1.57 (1.19-2.06)	1.57 (1.06-2.14)	3.44 (2.44-5.26)	7.26 (4.28-12.2)	11.8 (7.39-22.4)	316
Non-Hispanic blacks (2011 - 2012)	1.18 (1.01-1.38)	1.20 (.955-1.45)	2.64 (2.19-3.33)	6.50 (4.30-9.78)	11.1 (6.93-18.0)	665
Non-Hispanic whites (2011 - 2012)	*	1.23 (<LOD-1.45)	2.52 (2.13-3.04)	5.75 (4.69-6.54)	10.0 (8.08-12.9)	811
All Hispanics (2011 - 2012)	1.73 (1.44-2.08)	1.79 (1.48-2.14)	3.55 (2.82-4.89)	7.73 (5.54-10.9)	12.7 (8.51-19.8)	571
Asians (2011 - 2012)	1.79 (1.52-2.10)	1.75 (1.50-2.07)	3.91 (3.49-4.37)	8.75 (6.61-10.3)	11.5 (10.0-15.0)	352

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DMP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(3-carboxypropyl) phthalate (MCPP) (2001 – 2010)

CAS Number 66851-46-5

Metabolite of Di-n-octyl phthalate (DOP) and of several high molecular weight phthalates

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	2.75 (2.49-3.04)	3.10 (2.80-3.30)	5.70 (5.10-6.40)	10.0 (8.90-11.3)	14.6 (12.7-17.5)	2782
Total population (2003 - 2004)	2.91 (2.79-3.04)	3.10 (3.00-3.30)	5.70 (5.20-6.10)	10.2 (9.20-11.8)	15.3 (13.8-16.2)	2605
Total population (2005 - 2006)	2.05 (1.87-2.26)	2.10 (1.90-2.40)	4.40 (4.00-4.80)	8.90 (7.60-10.1)	13.1 (10.6-17.4)	2548
Total population (2007 - 2008)	2.76 (2.52-3.04)	2.70 (2.50-3.00)	5.80 (5.20-6.50)	11.1 (9.70-13.1)	18.1 (15.4-22.3)	2604
Total population (2009 - 2010)	3.02 (2.58-3.53)	3.10 (2.57-3.65)	6.44 (5.44-7.70)	13.4 (11.4-16.5)	22.3 (19.5-26.2)	2749
Age 6-11 years (2001 - 2002)	6.11 (5.46-6.84)	6.70 (5.40-7.50)	11.8 (10.2-13.3)	20.1 (17.8-23.1)	24.7 (22.2-31.6)	393
Age 6-11 years (2003 - 2004)	6.86 (5.80-8.11)	7.10 (6.00-8.90)	12.7 (10.4-16.4)	22.0 (17.2-27.7)	29.2 (22.3-36.6)	342
Age 6-11 years (2005 - 2006)	4.82 (4.09-5.68)	4.90 (4.30-5.90)	8.50 (6.70-10.4)	13.1 (10.3-17.9)	17.9 (12.6-34.5)	356
Age 6-11 years (2007 - 2008)	6.01 (4.80-7.53)	6.40 (5.10-8.00)	11.3 (8.40-15.9)	20.3 (13.2-27.3)	23.9 (19.1-34.1)	389
Age 6-11 years (2009 - 2010)	4.54 (3.74-5.52)	4.86 (3.71-6.49)	9.08 (7.14-11.2)	14.4 (10.8-20.3)	20.3 (14.3-51.9)	415
Age 12-19 years (2001 - 2002)	3.71 (3.18-4.33)	4.00 (3.40-4.70)	7.10 (6.10-8.10)	11.5 (9.50-12.7)	14.1 (11.8-19.0)	742
Age 12-19 years (2003 - 2004)	3.72 (3.33-4.15)	4.10 (3.50-4.60)	7.20 (5.80-8.40)	11.0 (9.50-13.6)	15.4 (13.4-17.9)	729
Age 12-19 years (2005 - 2006)	2.96 (2.52-3.46)	3.10 (2.50-3.60)	5.90 (4.80-7.30)	11.8 (9.10-14.5)	17.0 (12.7-21.5)	702
Age 12-19 years (2007 - 2008)	3.81 (3.15-4.61)	4.00 (3.20-4.70)	8.20 (6.90-9.40)	13.3 (11.1-17.1)	24.1 (13.8-25.6)	401
Age 12-19 years (2009 - 2010)	3.65 (2.88-4.64)	3.74 (2.90-4.74)	7.16 (5.48-9.32)	15.9 (10.8-25.8)	32.3 (20.9-54.3)	420
Age 20+ years (2001 - 2002)	2.37 (2.11-2.66)	2.60 (2.20-3.00)	4.80 (4.30-5.40)	8.10 (7.20-9.50)	12.0 (10.1-14.2)	1647
Age 20+ years (2003 - 2004)	2.53 (2.41-2.66)	2.80 (2.60-2.90)	4.90 (4.50-5.20)	8.10 (7.50-8.90)	13.2 (10.8-14.3)	1534
Age 20+ years (2005 - 2006)	1.76 (1.60-1.93)	1.70 (1.60-2.00)	3.60 (3.20-4.10)	7.10 (6.10-8.40)	11.3 (9.60-13.6)	1490
Age 20+ years (2007 - 2008)	2.41 (2.18-2.67)	2.50 (2.20-2.60)	5.00 (4.60-5.50)	9.60 (8.00-11.1)	15.6 (12.9-19.9)	1814
Age 20+ years (2009 - 2010)	2.80 (2.40-3.28)	2.88 (2.42-3.39)	6.00 (5.04-7.15)	13.1 (10.8-16.4)	21.8 (18.7-27.9)	1914
Males (2001 - 2002)	2.89 (2.64-3.17)	3.10 (2.80-3.40)	5.70 (5.00-6.80)	9.90 (8.70-12.0)	14.2 (12.4-18.1)	1371
Males (2003 - 2004)	3.25 (3.01-3.52)	3.30 (3.00-3.60)	6.00 (5.60-6.80)	11.8 (10.1-13.6)	16.0 (14.2-20.0)	1250
Males (2005 - 2006)	2.32 (2.11-2.54)	2.40 (2.00-2.70)	4.70 (4.30-5.20)	9.60 (7.90-11.8)	14.5 (11.5-22.3)	1270
Males (2007 - 2008)	3.02 (2.70-3.39)	2.90 (2.60-3.30)	5.80 (5.10-6.60)	12.3 (10.1-15.3)	21.3 (16.7-28.5)	1294
Males (2009 - 2010)	3.37 (2.86-3.96)	3.42 (2.91-4.04)	7.09 (6.04-8.32)	15.5 (12.9-18.7)	23.6 (19.9-33.0)	1399
Females (2001 - 2002)	2.62 (2.29-2.99)	3.00 (2.50-3.30)	5.70 (5.00-6.30)	10.0 (8.50-11.5)	14.7 (11.2-20.3)	1411
Females (2003 - 2004)	2.63 (2.44-2.83)	3.00 (2.60-3.20)	5.20 (4.70-5.80)	9.20 (8.20-10.3)	13.4 (11.0-16.2)	1355
Females (2005 - 2006)	1.83 (1.59-2.10)	1.80 (1.60-2.10)	4.00 (3.30-4.60)	8.00 (6.60-9.50)	12.1 (9.50-14.7)	1278
Females (2007 - 2008)	2.54 (2.30-2.79)	2.60 (2.30-3.00)	5.90 (5.00-6.80)	10.5 (9.10-12.3)	15.4 (13.3-21.5)	1310
Females (2009 - 2010)	2.72 (2.29-3.22)	2.79 (2.25-3.40)	5.78 (4.67-7.20)	12.6 (9.86-15.9)	20.7 (15.9-29.7)	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06,07-08, and 09-10 are 0.4, 0.2, 0.2,0.2, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DOP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(3-carboxypropyl) phthalate (MCPP) (2001 – 2010)

CAS Number 66851-46-5

Metabolite of Di-n-octyl phthalate (DOP) and of several high molecular weight phthalates

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	2.67 (2.26-3.16)	3.00 (2.30-3.50)	5.30 (4.40-5.90)	9.20 (7.30-12.4)	13.6 (10.4-18.7)	677
Mexican Americans (2003 - 2004)	3.08 (2.86-3.32)	3.10 (2.80-3.40)	5.50 (4.80-6.10)	9.90 (7.90-12.6)	13.7 (11.5-19.8)	652
Mexican Americans (2005 - 2006)	2.24 (1.71-2.94)	2.20 (1.60-3.10)	4.50 (3.30-6.50)	9.40 (6.50-13.1)	14.1 (9.90-25.4)	637
Mexican Americans (2007 - 2008)	2.66 (2.37-3.00)	2.70 (2.40-3.20)	5.00 (4.30-5.70)	8.80 (7.60-11.2)	14.5 (11.5-17.8)	531
Mexican Americans (2009 - 2010)	2.31 (1.95-2.74)	2.32 (1.92-2.93)	5.11 (4.44-5.58)	8.95 (7.39-11.3)	14.8 (11.1-23.2)	566
Non-Hispanic blacks (2001 - 2002)	3.09 (2.81-3.40)	3.30 (2.90-3.60)	6.30 (5.50-6.50)	10.9 (9.10-13.0)	15.1 (13.5-22.4)	703
Non-Hispanic blacks (2003 - 2004)	3.30 (3.01-3.62)	3.20 (2.90-3.60)	6.10 (5.50-6.90)	11.6 (9.30-13.4)	20.1 (13.6-25.5)	699
Non-Hispanic blacks (2005 - 2006)	2.28 (2.03-2.57)	2.40 (2.10-2.80)	4.50 (3.80-5.60)	8.70 (7.10-10.3)	13.3 (10.4-16.5)	678
Non-Hispanic blacks (2007 - 2008)	2.94 (2.50-3.44)	2.90 (2.50-3.40)	5.80 (4.90-6.80)	12.2 (8.50-17.1)	21.1 (13.7-42.4)	597
Non-Hispanic blacks (2009 - 2010)	3.38 (2.66-4.31)	3.35 (2.49-4.56)	6.92 (5.86-8.97)	13.6 (10.2-21.0)	22.9 (17.9-28.7)	516
Non-Hispanic whites (2001 - 2002)	2.72 (2.40-3.08)	3.00 (2.60-3.30)	5.80 (4.80-6.80)	10.3 (8.90-11.9)	15.8 (12.6-19.5)	1216
Non-Hispanic whites (2003 - 2004)	2.87 (2.73-3.02)	3.10 (2.90-3.30)	5.60 (5.00-6.00)	10.1 (9.10-12.0)	15.2 (13.4-16.1)	1088
Non-Hispanic whites (2005 - 2006)	1.97 (1.81-2.15)	2.00 (1.80-2.20)	4.20 (3.80-4.60)	8.70 (6.80-10.3)	13.1 (10.0-17.5)	1038
Non-Hispanic whites (2007 - 2008)	2.84 (2.51-3.21)	2.90 (2.50-3.40)	6.10 (5.30-7.00)	11.4 (9.70-14.0)	18.1 (14.0-24.1)	1077
Non-Hispanic whites (2009 - 2010)	3.17 (2.65-3.79)	3.16 (2.60-3.87)	6.86 (5.72-8.32)	14.5 (12.6-17.8)	23.6 (18.9-35.7)	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06,07-08, and 09-10 are 0.4, 0.2, 0.2,0.2, and 0.2 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DOP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(3-carboxypropyl) phthalate (MCPP) (2011 – 2016)

CAS Number 66851-46-5

Metabolite of Di-n-octyl phthalate (DOP) and of several high molecular weight phthalates

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	3.01 (2.59-3.50)	2.70 (2.40-3.10)	6.60 (5.60-7.90)	16.9 (13.1-23.1)	34.4 (21.3-51.8)	2489
Total population (2013 - 2014)	2.14 (1.97-2.32)	2.00 (1.80-2.20)	4.90 (4.40-5.30)	11.2 (9.60-13.0)	19.5 (16.5-22.3)	2685
Total population (2015 - 2016)	1.15 (.977-1.35)	1.10 (.900-1.30)	2.30 (1.80-2.80)	5.10 (3.70-7.50)	8.60 (6.70-12.2)	2975
Age 3-5 years (2015 - 2016)	1.72 (1.48-2.00)	1.70 (1.40-1.90)	3.30 (2.80-4.20)	6.10 (5.00-7.70)	8.80 (7.50-11.0)	465
Age 6-11 years (2011 - 2012)	3.38 (2.87-3.97)	3.20 (2.70-4.10)	6.80 (5.50-8.50)	11.0 (9.40-14.1)	20.7 (13.7-34.2)	396
Age 6-11 years (2013 - 2014)	3.11 (2.60-3.70)	3.10 (2.60-3.70)	5.60 (4.70-8.10)	13.0 (9.00-17.6)	21.2 (15.8-29.3)	409
Age 6-11 years (2015 - 2016)	1.79 (1.57-2.03)	1.80 (1.50-2.00)	3.10 (2.70-3.60)	6.80 (4.70-7.90)	9.80 (7.50-12.7)	415
Age 12-19 years (2011 - 2012)	3.26 (2.59-4.12)	3.00 (2.20-4.10)	6.80 (5.80-9.90)	22.2 (13.1-38.4)	45.0 (24.6-58.9)	388
Age 12-19 years (2013 - 2014)	2.53 (2.13-3.02)	2.30 (1.90-3.10)	5.60 (4.30-7.10)	11.8 (7.40-22.5)	25.5 (11.8-58.6)	462
Age 12-19 years (2015 - 2016)	1.31 (1.03-1.68)	1.30 (1.10-1.60)	2.40 (1.90-3.10)	4.80 (3.20-8.20)	8.40 (4.40-16.0)	405
Age 20+ years (2011 - 2012)	2.94 (2.46-3.50)	2.60 (2.30-3.00)	6.50 (5.40-7.70)	16.9 (12.8-23.5)	34.4 (19.8-56.3)	1705
Age 20+ years (2013 - 2014)	2.00 (1.83-2.20)	1.80 (1.70-2.00)	4.70 (4.00-5.20)	10.9 (9.30-12.7)	18.4 (15.8-21.3)	1814
Age 20+ years (2015 - 2016)	1.06 (.897-1.24)	.900 (.800-1.10)	2.00 (1.60-2.70)	5.10 (3.30-7.50)	8.60 (6.10-12.4)	1690
Males (2011 - 2012)	3.52 (2.94-4.22)	2.80 (2.50-3.50)	7.30 (5.90-10.0)	18.7 (13.0-33.2)	48.0 (22.1-106)	1259
Males (2013 - 2014)	2.37 (2.10-2.68)	2.20 (2.00-2.50)	5.10 (4.50-5.80)	11.9 (9.10-16.0)	20.8 (17.3-26.4)	1285
Males (2015 - 2016)	1.27 (1.06-1.53)	1.20 (1.00-1.50)	2.40 (1.90-3.10)	5.50 (4.00-8.30)	10.4 (6.40-15.4)	1474
Females (2011 - 2012)	2.58 (2.24-2.97)	2.50 (2.20-2.80)	6.00 (4.80-7.00)	15.5 (11.2-19.8)	27.8 (17.7-40.2)	1230
Females (2013 - 2014)	1.94 (1.74-2.16)	1.80 (1.60-2.00)	4.70 (4.00-5.30)	10.4 (8.70-12.9)	17.5 (14.2-25.4)	1400
Females (2015 - 2016)	1.04 (.888-1.22)	1.00 (.800-1.20)	2.10 (1.70-2.60)	4.50 (3.50-6.90)	8.40 (5.50-9.90)	1501
Mexican Americans (2011 - 2012)	2.58 (2.12-3.13)	2.40 (2.10-2.80)	4.50 (3.60-6.00)	12.2 (6.60-22.2)	22.2 (12.2-50.7)	316
Mexican Americans (2013 - 2014)	1.75 (1.53-2.01)	1.90 (1.40-2.20)	3.70 (3.10-4.50)	7.60 (6.10-9.10)	14.6 (9.10-19.9)	438
Mexican Americans (2015 - 2016)	1.15 (1.02-1.30)	1.00 (.900-1.20)	2.10 (1.80-2.60)	5.80 (4.00-7.60)	11.4 (7.20-13.4)	595
Non-Hispanic blacks (2011 - 2012)	3.55 (3.13-4.02)	3.00 (2.70-3.30)	6.80 (5.60-8.10)	19.7 (13.4-25.0)	30.9 (25.0-39.8)	665
Non-Hispanic blacks (2013 - 2014)	2.19 (1.88-2.54)	2.00 (1.80-2.50)	4.20 (3.60-5.10)	9.60 (6.40-16.4)	18.3 (11.0-30.0)	609
Non-Hispanic blacks (2015 - 2016)	1.30 (.987-1.72)	1.20 (.900-1.60)	2.60 (1.80-3.60)	6.10 (3.50-9.40)	10.6 (7.40-15.2)	698
Non-Hispanic whites (2011 - 2012)	3.03 (2.54-3.62)	2.80 (2.30-3.30)	6.70 (5.50-8.80)	16.9 (12.8-24.4)	37.2 (18.3-51.8)	813
Non-Hispanic whites (2013 - 2014)	2.23 (2.03-2.43)	2.00 (1.90-2.30)	5.20 (4.80-5.80)	11.7 (10.3-14.5)	19.5 (16.1-25.4)	987
Non-Hispanic whites (2015 - 2016)	1.15 (.968-1.36)	1.10 (.900-1.30)	2.30 (1.80-2.80)	5.10 (3.50-8.30)	8.60 (6.00-12.6)	862
All Hispanics (2011 - 2012)	2.79 (2.19-3.56)	2.40 (2.10-2.70)	5.70 (4.20-7.80)	16.3 (9.00-33.7)	35.1 (14.9-115)	571
All Hispanics (2013 - 2014)	1.95 (1.68-2.27)	2.00 (1.60-2.30)	4.30 (3.70-4.80)	9.10 (6.70-14.6)	17.5 (9.50-27.4)	690
All Hispanics (2015 - 2016)	1.18 (1.02-1.35)	1.10 (.900-1.20)	2.20 (1.90-2.70)	5.60 (3.80-7.40)	9.90 (7.10-12.3)	971
Asians (2011 - 2012)	2.24 (1.66-3.01)	2.00 (1.50-2.60)	4.60 (3.60-6.90)	11.5 (7.70-25.7)	33.2 (11.5-74.3)	352
Asians (2013 - 2014)	1.40 (1.14-1.73)	1.30 (1.00-1.80)	2.90 (2.50-3.20)	5.80 (4.50-8.30)	13.5 (7.00-28.4)	289
Asians (2015 - 2016)	.891 (.705-1.13)	.700 (.500-1.00)	1.70 (1.40-2.30)	4.50 (2.70-6.80)	6.80 (3.80-38.4)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.2, 0.4, and 0.4, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DOP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(3-carboxypropyl) phthalate (MCPP) (creatinine corrected) (2001 – 2010)

CAS Number 66851-46-5

Metabolite of Di-n-octyl phthalate (DOP) and of several high molecular weight phthalates

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	2.58 (2.35-2.83)	2.47 (2.25-2.76)	4.08 (3.87-4.48)	7.24 (6.58-8.00)	11.4 (10.0-12.5)	2782
Total population (2003 - 2004)	2.74 (2.56-2.93)	2.60 (2.42-2.79)	4.39 (3.94-4.86)	7.70 (6.65-8.60)	10.7 (9.53-11.9)	2605
Total population (2005 - 2006)	2.00 (1.82-2.20)	1.86 (1.67-2.06)	3.55 (3.14-4.00)	6.80 (5.77-7.95)	10.3 (8.68-12.7)	2548
Total population (2007 - 2008)	2.79 (2.63-2.96)	2.53 (2.37-2.70)	4.76 (4.33-5.16)	9.70 (8.52-10.9)	14.8 (12.7-17.0)	2604
Total population (2009 - 2010)	3.15 (2.77-3.59)	2.94 (2.55-3.38)	5.71 (4.88-6.72)	11.8 (10.5-13.5)	18.8 (16.0-21.9)	2749
Age 6-11 years (2001 - 2002)	6.96 (6.29-7.70)	7.08 (5.83-7.87)	11.2 (9.15-14.0)	20.7 (15.5-22.3)	26.4 (20.7-27.0)	393
Age 6-11 years (2003 - 2004)	7.25 (6.43-8.18)	7.06 (5.93-7.59)	11.2 (9.38-12.4)	19.1 (14.4-25.6)	26.9 (19.3-29.0)	342
Age 6-11 years (2005 - 2006)	5.31 (4.57-6.17)	5.06 (4.57-5.79)	8.78 (7.50-10.0)	13.7 (10.2-21.3)	21.3 (13.2-36.7)	356
Age 6-11 years (2007 - 2008)	7.41 (5.87-9.34)	6.81 (5.50-9.05)	11.6 (9.43-14.1)	20.2 (12.7-39.2)	30.4 (16.5-68.9)	389
Age 6-11 years (2009 - 2010)	5.92 (5.09-6.88)	5.94 (5.09-6.92)	9.47 (8.38-10.3)	15.5 (10.7-23.7)	22.7 (13.6-47.2)	415
Age 12-19 years (2001 - 2002)	2.86 (2.52-3.25)	2.94 (2.50-3.36)	4.59 (4.03-5.23)	6.69 (6.30-7.25)	9.55 (8.03-10.7)	742
Age 12-19 years (2003 - 2004)	2.78 (2.54-3.05)	2.75 (2.53-2.99)	4.55 (4.05-5.15)	6.61 (6.15-7.20)	8.24 (7.00-10.2)	729
Age 12-19 years (2005 - 2006)	2.20 (1.90-2.55)	2.07 (1.76-2.46)	3.67 (2.99-4.39)	6.84 (5.35-8.67)	9.67 (7.12-11.4)	702
Age 12-19 years (2007 - 2008)	2.96 (2.59-3.38)	2.95 (2.51-3.62)	5.04 (4.33-6.00)	8.18 (6.75-10.4)	10.9 (9.38-15.1)	401
Age 12-19 years (2009 - 2010)	2.94 (2.40-3.60)	2.67 (2.26-3.28)	4.68 (4.04-5.56)	10.8 (7.30-17.8)	21.4 (15.6-29.9)	420
Age 20+ years (2001 - 2002)	2.24 (2.03-2.47)	2.20 (2.00-2.40)	3.51 (3.11-3.95)	5.39 (4.82-6.18)	7.71 (6.71-9.28)	1647
Age 20+ years (2003 - 2004)	2.43 (2.27-2.61)	2.38 (2.19-2.56)	3.70 (3.33-4.08)	6.09 (5.38-7.06)	8.79 (7.84-9.56)	1534
Age 20+ years (2005 - 2006)	1.76 (1.60-1.94)	1.67 (1.47-1.86)	2.96 (2.60-3.38)	5.55 (4.61-6.46)	8.46 (7.00-10.3)	1490
Age 20+ years (2007 - 2008)	2.48 (2.33-2.64)	2.26 (2.14-2.36)	4.00 (3.68-4.39)	8.03 (7.11-9.09)	12.7 (11.1-14.8)	1814
Age 20+ years (2009 - 2010)	2.97 (2.60-3.39)	2.75 (2.38-3.22)	5.25 (4.45-6.31)	11.3 (9.63-13.2)	18.1 (15.4-21.6)	1914
Males (2001 - 2002)	2.35 (2.17-2.56)	2.20 (2.02-2.42)	3.76 (3.45-4.20)	7.17 (6.27-8.06)	11.5 (9.28-15.1)	1371
Males (2003 - 2004)	2.55 (2.39-2.72)	2.36 (2.22-2.47)	4.14 (3.52-4.86)	7.84 (6.80-8.79)	11.6 (10.2-13.5)	1250
Males (2005 - 2006)	1.86 (1.70-2.03)	1.70 (1.53-1.88)	3.33 (2.92-3.70)	6.70 (5.59-8.33)	10.7 (8.72-14.2)	1270
Males (2007 - 2008)	2.54 (2.34-2.76)	2.32 (2.10-2.50)	4.17 (3.80-4.81)	8.91 (7.37-11.2)	14.7 (12.9-17.5)	1294
Males (2009 - 2010)	3.02 (2.61-3.49)	2.82 (2.43-3.36)	5.51 (4.70-6.36)	10.9 (9.84-12.1)	18.5 (13.7-23.7)	1399
Females (2001 - 2002)	2.81 (2.48-3.18)	2.76 (2.46-3.02)	4.39 (3.97-4.92)	7.66 (6.17-8.69)	11.0 (8.62-15.9)	1411
Females (2003 - 2004)	2.93 (2.68-3.20)	2.89 (2.58-3.23)	4.53 (4.09-5.00)	7.58 (6.44-8.57)	10.0 (8.60-11.6)	1355
Females (2005 - 2006)	2.15 (1.88-2.45)	2.00 (1.72-2.44)	3.77 (3.15-4.47)	6.90 (5.62-8.43)	10.0 (8.14-12.5)	1278
Females (2007 - 2008)	3.04 (2.84-3.25)	2.80 (2.50-3.11)	5.08 (4.64-5.52)	10.3 (8.67-11.3)	15.0 (11.8-17.8)	1310
Females (2009 - 2010)	3.28 (2.88-3.74)	3.00 (2.58-3.46)	5.87 (4.96-7.05)	13.0 (10.3-14.8)	19.1 (15.4-29.5)	1350

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Urinary Mono-(3-carboxypropyl) phthalate (MCPP) (creatinine corrected) (2001 – 2010)

CAS Number 66851-46-5

Metabolite of Di-n-octyl phthalate (DOP) and of several high molecular weight phthalates

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	2.52 (2.21-2.88)	2.37 (2.07-2.73)	4.29 (3.73-5.00)	7.36 (5.58-10.3)	11.4 (8.36-14.5)	677
Mexican Americans (2003 - 2004)	2.78 (2.56-3.02)	2.63 (2.30-2.96)	4.32 (3.66-4.96)	8.14 (6.72-10.3)	12.8 (9.37-17.1)	652
Mexican Americans (2005 - 2006)	2.02 (1.62-2.51)	1.79 (1.42-2.53)	3.85 (2.74-5.22)	7.00 (5.40-8.82)	10.2 (7.64-16.4)	637
Mexican Americans (2007 - 2008)	2.60 (2.26-2.99)	2.45 (2.05-3.10)	4.31 (3.49-5.22)	8.31 (6.67-9.76)	12.9 (9.50-15.5)	531
Mexican Americans (2009 - 2010)	2.29 (1.92-2.74)	2.08 (1.76-2.60)	4.29 (3.61-5.05)	9.02 (7.16-11.4)	13.7 (10.9-17.8)	566
Non-Hispanic blacks (2001 - 2002)	2.17 (2.02-2.33)	2.07 (1.88-2.28)	3.68 (3.25-4.07)	6.73 (5.46-7.70)	10.0 (8.27-13.1)	703
Non-Hispanic blacks (2003 - 2004)	2.34 (2.13-2.58)	2.17 (1.99-2.45)	3.96 (3.33-4.43)	6.93 (6.03-8.80)	13.4 (9.32-15.9)	699
Non-Hispanic blacks (2005 - 2006)	1.61 (1.42-1.81)	1.58 (1.38-1.77)	2.76 (2.27-3.37)	5.63 (4.33-7.59)	8.68 (6.86-10.4)	678
Non-Hispanic blacks (2007 - 2008)	2.28 (1.96-2.65)	2.11 (1.72-2.35)	3.91 (3.33-4.56)	7.97 (5.58-12.8)	16.4 (8.21-57.0)	597
Non-Hispanic blacks (2009 - 2010)	2.45 (2.02-2.97)	2.26 (1.81-2.84)	4.14 (3.35-5.19)	8.02 (6.24-11.3)	14.7 (9.92-19.7)	516
Non-Hispanic whites (2001 - 2002)	2.69 (2.42-3.00)	2.57 (2.25-2.94)	4.19 (3.87-4.79)	7.63 (6.58-8.45)	11.8 (10.0-14.7)	1216
Non-Hispanic whites (2003 - 2004)	2.83 (2.60-3.09)	2.65 (2.43-2.96)	4.55 (3.90-5.16)	7.79 (6.59-8.79)	10.6 (9.43-11.3)	1088
Non-Hispanic whites (2005 - 2006)	2.08 (1.92-2.24)	1.95 (1.76-2.12)	3.60 (3.26-4.00)	6.47 (5.56-7.93)	10.3 (7.95-13.1)	1038
Non-Hispanic whites (2007 - 2008)	2.96 (2.72-3.23)	2.70 (2.50-2.93)	5.06 (4.35-5.77)	10.3 (8.61-11.5)	15.1 (12.3-19.3)	1077
Non-Hispanic whites (2009 - 2010)	3.57 (3.12-4.07)	3.28 (2.81-3.73)	6.33 (5.25-7.39)	13.2 (11.1-14.9)	21.6 (16.6-26.2)	1206

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Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-(3-carboxypropyl) phthalate (MCPP) (creatinine corrected) (2011 – 2016)

CAS Number 66851-46-5

Metabolite of Di-n-octyl phthalate (DOP) and of several high molecular weight phthalates

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	3.42 (2.93-3.99)	2.86 (2.44-3.33)	6.00 (4.95-7.75)	15.8 (10.8-23.6)	36.6 (18.8-65.9)	2487
Total population (2013 - 2014)	2.14 (1.95-2.35)	1.88 (1.72-2.14)	3.91 (3.37-4.60)	9.12 (7.96-11.4)	16.7 (14.1-19.1)	2684
Total population (2015 - 2016)	1.19 (1.04-1.36)	1.05 (.903-1.20)	2.07 (1.72-2.46)	4.38 (3.56-5.83)	7.48 (5.40-9.49)	2974
Age 3-5 years (2015 - 2016)	4.11 (3.60-4.69)	4.09 (3.43-4.74)	6.67 (5.81-7.35)	10.5 (8.60-13.3)	14.2 (12.4-17.6)	464
Age 6-11 years (2011 - 2012)	4.79 (4.18-5.49)	4.19 (3.60-4.67)	7.26 (5.81-8.61)	15.7 (8.97-26.7)	28.2 (16.4-39.8)	395
Age 6-11 years (2013 - 2014)	3.92 (3.36-4.58)	3.44 (2.97-4.11)	6.92 (5.22-8.53)	17.2 (9.57-25.3)	27.8 (13.0-36.6)	409
Age 6-11 years (2015 - 2016)	2.30 (2.06-2.56)	2.24 (1.79-2.55)	3.64 (3.03-4.05)	6.73 (5.50-7.08)	9.32 (7.08-11.5)	415
Age 12-19 years (2011 - 2012)	3.18 (2.50-4.04)	2.44 (1.82-3.31)	5.59 (3.85-8.33)	26.6 (8.44-45.7)	45.7 (17.4-80.0)	388
Age 12-19 years (2013 - 2014)	2.06 (1.72-2.45)	1.76 (1.55-2.29)	3.43 (2.99-4.39)	9.52 (5.96-14.5)	18.6 (10.1-30.0)	462
Age 12-19 years (2015 - 2016)	1.02 (.837-1.24)	.964 (.757-1.14)	1.71 (1.36-2.13)	3.10 (2.31-4.16)	5.68 (2.93-10.6)	405
Age 20+ years (2011 - 2012)	3.33 (2.83-3.93)	2.69 (2.34-3.16)	5.97 (4.78-7.89)	15.7 (10.7-22.1)	32.2 (17.1-69.6)	1704
Age 20+ years (2013 - 2014)	2.02 (1.82-2.24)	1.79 (1.59-2.01)	3.62 (3.07-4.47)	8.54 (7.33-10.7)	16.0 (13.1-18.9)	1813
Age 20+ years (2015 - 2016)	1.08 (.943-1.23)	.943 (.820-1.08)	1.74 (1.40-2.15)	3.88 (2.81-4.91)	6.74 (4.27-9.49)	1690
Males (2011 - 2012)	3.29 (2.80-3.86)	2.67 (2.35-3.07)	6.00 (4.86-7.58)	15.7 (10.1-25.0)	41.5 (17.2-89.9)	1258
Males (2013 - 2014)	1.99 (1.80-2.21)	1.79 (1.57-1.98)	3.67 (3.07-4.55)	8.54 (7.12-10.5)	15.3 (10.7-19.8)	1284
Males (2015 - 2016)	1.13 (.968-1.33)	.986 (.818-1.18)	2.07 (1.67-2.50)	4.80 (3.40-6.69)	8.09 (5.68-10.0)	1474
Females (2011 - 2012)	3.55 (2.95-4.27)	3.00 (2.44-3.65)	6.05 (4.80-8.45)	15.8 (9.78-25.7)	33.7 (16.2-65.9)	1229
Females (2013 - 2014)	2.30 (1.99-2.66)	2.06 (1.74-2.42)	4.21 (3.42-5.20)	10.0 (7.54-14.0)	17.4 (14.0-22.3)	1400
Females (2015 - 2016)	1.24 (1.09-1.42)	1.10 (.971-1.27)	2.09 (1.71-2.51)	4.08 (3.39-5.32)	6.62 (4.80-9.32)	1500
Mexican Americans (2011 - 2012)	2.91 (2.34-3.61)	2.50 (2.14-2.92)	4.88 (3.49-6.11)	11.5 (6.42-24.4)	24.4 (9.94-78.7)	316
Mexican Americans (2013 - 2014)	1.79 (1.62-1.98)	1.64 (1.40-2.03)	3.17 (2.70-3.56)	6.56 (5.36-9.09)	10.7 (6.92-17.8)	438
Mexican Americans (2015 - 2016)	1.25 (1.10-1.42)	1.12 (.947-1.27)	2.15 (1.92-2.54)	5.04 (4.03-6.19)	8.19 (6.67-10.7)	595
Non-Hispanic blacks (2011 - 2012)	2.76 (2.42-3.15)	2.27 (1.96-2.65)	4.82 (3.77-6.23)	11.8 (8.36-15.1)	22.9 (15.3-31.9)	665
Non-Hispanic blacks (2013 - 2014)	1.62 (1.44-1.81)	1.39 (1.18-1.74)	2.96 (2.48-3.40)	7.78 (5.25-10.0)	11.9 (8.28-19.8)	609
Non-Hispanic blacks (2015 - 2016)	1.04 (.834-1.29)	.896 (.730-1.13)	2.03 (1.47-2.66)	4.29 (3.33-5.85)	7.63 (5.40-10.5)	697
Non-Hispanic whites (2011 - 2012)	3.67 (3.06-4.42)	3.08 (2.58-3.93)	6.92 (5.14-9.10)	16.3 (11.2-27.0)	36.8 (17.6-69.6)	811
Non-Hispanic whites (2013 - 2014)	2.34 (2.09-2.63)	2.05 (1.76-2.39)	4.39 (3.49-5.41)	10.0 (8.11-13.8)	17.1 (14.7-20.3)	987
Non-Hispanic whites (2015 - 2016)	1.23 (1.09-1.40)	1.08 (.966-1.23)	2.14 (1.71-2.59)	4.26 (3.45-5.97)	7.44 (4.51-9.49)	862
All Hispanics (2011 - 2012)	3.13 (2.50-3.92)	2.45 (2.14-2.73)	5.31 (4.04-6.73)	15.1 (7.09-36.6)	34.6 (11.9-128)	571
All Hispanics (2013 - 2014)	1.94 (1.70-2.20)	1.76 (1.53-2.07)	3.39 (3.05-4.00)	8.19 (5.70-11.7)	14.7 (8.92-25.7)	690
All Hispanics (2015 - 2016)	1.24 (1.08-1.43)	1.11 (.946-1.25)	2.07 (1.75-2.48)	5.04 (4.02-6.67)	9.18 (6.79-11.0)	971
Asians (2011 - 2012)	3.00 (2.29-3.92)	2.54 (2.08-3.14)	4.64 (3.56-7.40)	14.7 (6.97-38.8)	38.8 (21.3-65.7)	352
Asians (2013 - 2014)	1.78 (1.51-2.10)	1.55 (1.19-1.93)	2.95 (2.32-4.05)	7.94 (5.88-9.62)	13.8 (8.00-34.1)	288
Asians (2015 - 2016)	1.10 (.931-1.31)	.966 (.800-1.10)	1.96 (1.42-2.50)	3.88 (2.73-5.31)	6.44 (3.88-23.6)	301

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DOP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-octyl phthalate (MOP) (1999 – 2010)‡

CAS Number 5393-19-1

Metabolite of Di-n-octyl phthalate (DOP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	2.69 (2.02-3.36)	4.87 (3.86-5.71)	2541
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2782
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2605
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2548
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2604
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2749
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	3.70 (<LOD-5.88)	5.38 (2.86-8.40)	328
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	342
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	389
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	415
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	2.86 (<LOD-4.20)	4.70 (3.36-7.06)	752
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	742
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	729
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	401
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	420
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	2.52 (1.85-3.19)	4.87 (3.53-5.88)	1461
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1647
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1534
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1914
Males (1999 - 2000)	*	< LOD	< LOD	2.69 (1.85-3.70)	4.70 (3.36-5.88)	1215
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1371
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1250
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1270
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1399
Females (1999 - 2000)	*	< LOD	< LOD	2.52 (2.02-3.53)	5.21 (3.70-6.38)	1326
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1411
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1355
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1278
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1310
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1350

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.51, 1.68, 1.68, 1.85, 1.85 and 0.84 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 1.68 for survey periods 1999-2008 compared with results previously reported.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DOP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-octyl phthalate (MOP) (1999 – 2010)‡

CAS Number 5393-19-1

Metabolite of Di-n-octyl phthalate (DOP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	1.85 (<LOD-2.35)	2.69 (2.35-4.37)	814
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	677
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	652
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	566
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	3.19 (<LOD-5.04)	5.04 (3.70-6.89)	603
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	703
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	699
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	516
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	2.69 (2.02-3.53)	5.04 (3.86-5.88)	912
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1216
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1088
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1206

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 1.51, 1.68, 1.68, 1.85, 1.85 and 0.84 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 1.68 for survey periods 1999-2008 compared with results previously reported.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DOP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-octyl phthalate (MOP) (creatinine corrected) (1999 – 2010)‡

CAS Number 5393-19-1

Metabolite of Di-n-octyl phthalate (DOP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	*	< LOD	< LOD	4.03 (3.48-4.38)	5.93 (4.96-7.21)	2541
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	2782
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	2605
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2548
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2604
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2749
Age 6-11 years (1999 - 2000)	*	< LOD	< LOD	3.73 (<LOD-6.30)	6.30 (3.31-17.2)	328
Age 6-11 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	342
Age 6-11 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	356
Age 6-11 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	389
Age 6-11 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	415
Age 12-19 years (1999 - 2000)	*	< LOD	< LOD	2.50 (<LOD-2.87)	3.16 (2.59-5.59)	752
Age 12-19 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	742
Age 12-19 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	729
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	702
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	401
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	420
Age 20+ years (1999 - 2000)	*	< LOD	< LOD	4.37 (3.48-4.89)	5.93 (5.04-7.76)	1461
Age 20+ years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1647
Age 20+ years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1534
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1490
Age 20+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1814
Age 20+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1914
Males (1999 - 2000)	*	< LOD	< LOD	3.06 (2.59-3.48)	4.30 (3.26-5.80)	1215
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1371
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1250
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1270
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1294
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1399
Females (1999 - 2000)	*	< LOD	< LOD	5.04 (4.20-5.96)	7.21 (5.59-10.5)	1326
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1411
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1355
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1278
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1310
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1350

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 1.68 for survey periods 1999-2008 compared with results previously reported..

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DOP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Mono-n-octyl phthalate (MOP) (creatinine corrected) (1999 – 2010)‡

CAS Number 5393-19-1

Metabolite of Di-n-octyl phthalate (DOP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.**

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	*	< LOD	< LOD	3.06 (<LOD-4.70)	5.59 (4.37-6.72)	814
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	677
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	652
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	637
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	531
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	566
Non-Hispanic blacks (1999 - 2000)	*	< LOD	< LOD	2.28 (<LOD-3.26)	3.73 (2.52-5.49)	603
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	703
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	699
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	678
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	597
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	516
Non-Hispanic whites (1999 - 2000)	*	< LOD	< LOD	4.38 (3.60-5.17)	6.12 (5.29-8.40)	912
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	1216
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1088
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1038
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1077
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1206

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

**To correct for inadequate purity in the analytical standards, all results and LODs have been adjusted by a factor of 1.68 for survey periods 1999-2008 compared with results previously reported.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DOP_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Cyclohexane-1,2-dicarboxylic acid mono hydroxyisononyl ester (MHNCH) (2011 – 2016)

CAS Number 5393-19-1

Metabolite of Di(isononyl) cyclohexane-1,2-dicarboxylate (DINCH)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	.600 (.500-.800)	1.10 (.900-1.20)	2489
Total population (2013 - 2014)	*	< LOD	< LOD	.900 (.800-1.00)	1.50 (1.30-1.90)	2685
Total population (2015 - 2016)	.758 (.680-.846)	.600 (.500-.700)	1.40 (1.20-1.70)	3.60 (2.90-4.80)	7.40 (5.30-10.3)	2975
Age 3-5 years (2015 - 2016)	1.36 (1.19-1.55)	1.30 (1.10-1.50)	2.70 (2.00-3.30)	4.70 (3.70-6.10)	7.80 (5.20-12.9)	465
Age 6-11 years (2011 - 2012)	*	< LOD	.800 (.600-1.10)	1.90 (1.20-2.70)	4.10 (1.90-6.00)	396
Age 6-11 years (2013 - 2014)	.684 (.585-.799)	.600 (.500-.800)	1.10 (1.00-1.60)	2.40 (2.10-3.10)	3.90 (2.80-4.60)	409
Age 6-11 years (2015 - 2016)	1.15 (.962-1.38)	1.10 (.800-1.30)	2.40 (1.90-2.90)	4.20 (3.10-7.80)	8.70 (4.20-13.2)	415
Age 12-19 years (2011 - 2012)	*	< LOD	.400 (<LOD-.600)	.900 (.600-1.30)	1.30 (.900-2.50)	388
Age 12-19 years (2013 - 2014)	*	< LOD	.600 (.500-.700)	1.10 (.800-1.70)	1.70 (1.20-2.50)	462
Age 12-19 years (2015 - 2016)	.966 (.817-1.14)	.800 (.600-1.00)	1.80 (1.30-2.40)	4.20 (2.90-6.00)	11.3 (5.70-17.1)	405
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	.500 (.400-.600)	.800 (.700-.900)	1705
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.700 (.600-.800)	1.10 (.900-1.40)	1814
Age 20+ years (2015 - 2016)	*	.500 (.400-.600)	1.20 (1.00-1.50)	3.40 (2.50-4.40)	7.20 (5.00-10.7)	1690
Males (2011 - 2012)	*	< LOD	< LOD	.700 (.600-1.00)	1.10 (.800-1.70)	1259
Males (2013 - 2014)	*	< LOD	< LOD	.800 (.700-1.00)	1.40 (1.20-1.70)	1285
Males (2015 - 2016)	.786 (.702-.879)	.600 (.500-.700)	1.50 (1.20-1.70)	3.90 (2.90-5.30)	7.80 (5.00-11.3)	1474
Females (2011 - 2012)	*	< LOD	< LOD	.600 (.500-.700)	.900 (.800-1.10)	1230
Females (2013 - 2014)	*	< LOD	< LOD	.900 (.800-1.10)	1.60 (1.30-1.90)	1400
Females (2015 - 2016)	*	.500 (.400-.700)	1.30 (1.10-1.70)	3.30 (2.60-4.40)	6.90 (5.30-11.2)	1501
Mexican Americans (2011 - 2012)	*	< LOD	.400 (<LOD-.500)	.800 (.600-1.10)	1.30 (.800-2.70)	316
Mexican Americans (2013 - 2014)	*	< LOD	.500 (<LOD-.600)	.900 (.800-1.10)	1.60 (.900-2.50)	438
Mexican Americans (2015 - 2016)	.861 (.715-1.04)	.700 (.500-.900)	1.50 (1.20-2.00)	4.10 (3.00-5.70)	9.10 (5.40-14.5)	595
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.500 (<LOD-.500)	.900 (.700-1.10)	1.20 (1.10-1.50)	665
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.500 (<LOD-.700)	1.10 (.900-1.40)	1.80 (1.40-2.20)	609
Non-Hispanic blacks (2015 - 2016)	.941 (.803-1.10)	.800 (.600-1.00)	1.70 (1.40-2.30)	4.70 (3.60-6.70)	10.1 (7.80-13.0)	698
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	.600 (.500-.700)	.900 (.700-1.10)	813
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.800 (.600-.900)	1.30 (1.00-1.70)	987
Non-Hispanic whites (2015 - 2016)	*	.500 (.400-.600)	1.30 (1.00-1.80)	3.40 (2.50-5.00)	7.00 (4.20-11.3)	862
All Hispanics (2011 - 2012)	*	< LOD	< LOD	.700 (.600-.900)	1.10 (.800-1.60)	571
All Hispanics (2013 - 2014)	*	< LOD	.500 (<LOD-.600)	.900 (.800-1.10)	1.60 (1.10-2.30)	690
All Hispanics (2015 - 2016)	.793 (.670-.938)	.600 (.500-.800)	1.40 (1.20-1.70)	3.90 (2.70-5.70)	7.50 (5.80-10.9)	971
Asians (2011 - 2012)	*	< LOD	< LOD	1.00 (.700-1.50)	2.00 (1.20-5.50)	352
Asians (2013 - 2014)	*	< LOD	< LOD	1.00 (.600-2.10)	2.90 (1.10-7.80)	289
Asians (2015 - 2016)	*	.500 (<LOD-.600)	1.10 (.900-1.30)	3.10 (1.70-4.00)	5.10 (3.50-7.60)	301

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.4, 0.4, and 0.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DINCH_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Cyclohexane-1,2-dicarboxylic acid mono hydroxyisononyl ester (MHNCH) (2011 – 2016)

CAS Number 5393-19-1

Metabolite of Di(isononyl) cyclohexane-1,2-dicarboxylate (DINCH)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	1.12 (1.01-1.22)	1.57 (1.39-1.87)	2487
Total population (2013 - 2014)	*	< LOD	< LOD	1.17 (1.08-1.26)	1.67 (1.54-1.87)	2684
Total population (2015 - 2016)	.785 (.705-.874)	.658 (.571-.755)	1.38 (1.25-1.63)	3.64 (2.87-4.39)	6.67 (5.36-7.53)	2974
Age 3-5 years (2015 - 2016)	3.22 (2.81-3.69)	2.82 (2.50-3.17)	5.46 (4.55-6.92)	12.1 (8.85-14.9)	21.3 (13.9-23.6)	464
Age 6-11 years (2011 - 2012)	*	< LOD	1.27 (1.04-1.40)	2.22 (1.65-3.11)	3.81 (2.38-6.64)	395
Age 6-11 years (2013 - 2014)	.864 (.750-.995)	.811 (.755-.896)	1.47 (1.25-1.78)	2.82 (2.27-3.21)	4.17 (3.21-5.80)	409
Age 6-11 years (2015 - 2016)	1.48 (1.29-1.71)	1.37 (1.15-1.60)	2.54 (2.02-3.13)	5.19 (3.81-6.74)	9.29 (6.08-17.1)	415
Age 12-19 years (2011 - 2012)	*	< LOD	.581 (<LOD-.700)	1.00 (.778-1.33)	1.57 (1.04-2.86)	388
Age 12-19 years (2013 - 2014)	*	< LOD	.571 (.476-.667)	.966 (.751-1.17)	1.21 (1.04-1.75)	462
Age 12-19 years (2015 - 2016)	.751 (.635-.887)	.611 (.491-.757)	1.25 (1.04-1.67)	3.59 (2.14-5.75)	6.94 (4.55-10.1)	405
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	1.03 (.933-1.12)	1.39 (1.17-1.65)	1704
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	1.04 (.933-1.17)	1.46 (1.22-1.74)	1813
Age 20+ years (2015 - 2016)	*	.571 (.500-.682)	1.21 (.973-1.38)	2.86 (2.16-4.20)	5.40 (4.50-6.67)	1690
Males (2011 - 2012)	*	< LOD	< LOD	.916 (.778-1.08)	1.39 (1.08-1.59)	1258
Males (2013 - 2014)	*	< LOD	< LOD	.930 (.800-1.08)	1.40 (1.08-1.67)	1284
Males (2015 - 2016)	.701 (.624-.788)	.566 (.488-.664)	1.29 (1.08-1.56)	3.11 (2.34-4.39)	5.75 (5.00-6.61)	1474
Females (2011 - 2012)	*	< LOD	< LOD	1.22 (1.12-1.40)	1.91 (1.47-2.55)	1229
Females (2013 - 2014)	*	< LOD	< LOD	1.31 (1.17-1.56)	1.96 (1.58-2.50)	1400
Females (2015 - 2016)	*	.759 (.667-.824)	1.47 (1.33-1.86)	4.04 (3.11-4.67)	7.32 (5.75-9.44)	1500
Mexican Americans (2011 - 2012)	*	< LOD	.667 (<LOD-.755)	1.22 (.903-1.47)	1.61 (1.27-2.76)	316
Mexican Americans (2013 - 2014)	*	< LOD	.636 (<LOD-.800)	1.22 (.941-1.61)	1.80 (1.33-2.37)	438
Mexican Americans (2015 - 2016)	.937 (.799-1.10)	.778 (.622-.930)	1.82 (1.38-2.36)	4.84 (3.65-6.55)	8.48 (6.49-14.0)	595
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.449 (<LOD-.528)	.848 (.757-.952)	1.23 (1.02-1.57)	665
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.517 (<LOD-.596)	.927 (.820-1.02)	1.27 (1.04-1.47)	609
Non-Hispanic blacks (2015 - 2016)	.748 (.645-.868)	.646 (.526-.743)	1.46 (1.19-1.82)	3.64 (2.81-4.44)	7.58 (5.29-10.4)	697
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	1.12 (1.00-1.22)	1.56 (1.22-2.00)	811
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	1.17 (1.04-1.27)	1.65 (1.40-1.98)	987
Non-Hispanic whites (2015 - 2016)	*	.651 (.542-.778)	1.37 (1.16-1.75)	3.46 (2.50-4.75)	6.41 (4.62-7.54)	862
All Hispanics (2011 - 2012)	*	< LOD	< LOD	1.12 (.824-1.47)	1.54 (1.27-1.87)	571
All Hispanics (2013 - 2014)	*	< LOD	.609 (<LOD-.757)	1.22 (1.02-1.54)	1.87 (1.61-2.31)	690
All Hispanics (2015 - 2016)	.835 (.731-.954)	.683 (.596-.783)	1.56 (1.22-2.00)	4.33 (3.21-5.47)	7.18 (5.36-11.3)	971
Asians (2011 - 2012)	*	< LOD	< LOD	1.89 (1.33-2.22)	3.57 (2.00-7.00)	352
Asians (2013 - 2014)	*	< LOD	< LOD	1.47 (1.04-2.84)	3.93 (1.47-8.84)	288
Asians (2015 - 2016)	*	.778 (<LOD-.932)	1.39 (1.16-1.75)	3.56 (2.32-4.55)	6.09 (3.81-7.14)	301

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DINCH_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Phthalates_FactSheet.html

Urinary Cyclohexane-1,2-dicarboxylic acid mono carboxyisooctyl ester (MCOCH) (2015 – 2016)

CAS Number 5393-19-1

Metabolite of Di(isononyl) cyclohexane-1,2-dicarboxylate (DINCH)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	*	.500 (.500-.600)	1.00 (.800-1.10)	2.10 (1.80-2.70)	4.00 (3.20-5.00)	2975
Age 3-5 years (2015 - 2016)	1.02 (.928-1.12)	.900 (.800-1.00)	1.70 (1.40-2.00)	3.40 (2.40-4.00)	4.90 (3.90-6.00)	465
Age 6-11 years (2015 - 2016)	.894 (.776-1.03)	.800 (.700-.900)	1.40 (1.10-1.60)	3.60 (1.90-5.10)	5.10 (3.70-7.40)	415
Age 12-19 years (2015 - 2016)	.742 (.656-.838)	.600 (.500-.600)	1.00 (.900-1.20)	2.20 (1.70-3.10)	4.50 (2.60-9.90)	405
Age 20+ years (2015 - 2016)	*	.500 (<LOD-.600)	.800 (.700-1.00)	2.00 (1.70-2.70)	3.40 (2.80-4.90)	1690
Males (2015 - 2016)	*	.600 (.500-.600)	1.00 (.900-1.20)	2.30 (1.80-3.00)	3.80 (3.20-4.50)	1474
Females (2015 - 2016)	*	.500 (.500-.600)	.900 (.800-1.00)	2.00 (1.50-2.70)	4.30 (2.80-5.70)	1501
Mexican Americans (2015 - 2016)	*	.600 (<LOD-.800)	1.10 (.900-1.30)	2.70 (1.90-3.60)	4.90 (3.50-7.00)	595
Non-Hispanic blacks (2015 - 2016)	.749 (.663-.847)	.600 (.500-.700)	1.10 (.900-1.40)	3.00 (2.20-3.70)	5.10 (4.30-7.00)	698
Non-Hispanic whites (2015 - 2016)	*	.500 (.500-.600)	.900 (.800-1.10)	2.00 (1.70-2.70)	3.40 (2.60-5.10)	862
All Hispanics (2015 - 2016)	*	.600 (<LOD-.700)	1.00 (.800-1.30)	2.10 (1.70-3.10)	4.30 (3.10-5.70)	971
Asians (2015 - 2016)	*	< LOD	.700 (.600-1.00)	1.60 (1.00-2.50)	2.70 (1.80-5.80)	301

Limit of detection (LOD, see Data Analysis section) for Survey year 15-16 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DINCH_BiomonitoringSummary.html

Urinary Cyclohexane-1,2-dicarboxylic acid mono carboxyisooctyl ester (MCOCH) (creatinine corrected) (2015 – 2016)

CAS Number 5393-19-1

Metabolite of Di(isononyl) cyclohexane-1,2-dicarboxylate (DINCH)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	*	.620 (.559-.686)	1.22 (1.07-1.35)	2.40 (2.05-2.87)	3.94 (3.49-4.58)	2974
Age 3-5 years (2015 - 2016)	2.43 (2.15-2.75)	2.08 (1.85-2.39)	4.06 (3.59-4.71)	7.78 (5.83-9.23)	11.7 (8.75-17.1)	464
Age 6-11 years (2015 - 2016)	1.15 (1.02-1.30)	1.03 (.928-1.20)	1.88 (1.53-2.19)	3.42 (2.90-4.58)	5.83 (3.54-9.02)	415
Age 12-19 years (2015 - 2016)	.576 (.507-.655)	.500 (.467-.556)	.872 (.682-1.21)	1.94 (1.49-3.19)	3.66 (2.38-5.00)	405
Age 20+ years (2015 - 2016)	*	.583 (<LOD-.648)	1.08 (.948-1.29)	2.06 (1.72-2.48)	3.32 (2.65-4.08)	1690
Males (2015 - 2016)	*	.538 (.493-.602)	1.07 (.867-1.29)	1.96 (1.67-2.50)	3.18 (2.86-3.92)	1474
Females (2015 - 2016)	*	.696 (.625-.778)	1.37 (1.20-1.53)	2.86 (2.33-3.37)	4.46 (3.91-5.00)	1500
Mexican Americans (2015 - 2016)	*	.686 (<LOD-.814)	1.40 (1.24-1.59)	3.18 (2.59-3.84)	5.83 (3.59-8.66)	595
Non-Hispanic blacks (2015 - 2016)	.597 (.518-.688)	.505 (.452-.574)	1.06 (.849-1.31)	2.44 (1.82-3.33)	4.58 (3.51-5.35)	697
Non-Hispanic whites (2015 - 2016)	*	.648 (.565-.735)	1.22 (1.03-1.38)	2.25 (1.91-2.90)	3.72 (2.92-5.00)	862
All Hispanics (2015 - 2016)	*	.619 (<LOD-.700)	1.30 (1.05-1.50)	2.86 (2.10-3.75)	5.26 (3.59-6.36)	971
Asians (2015 - 2016)	*	< LOD	1.32 (1.06-1.46)	2.19 (1.76-3.00)	3.33 (2.50-4.57)	301

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DINCH_BiomonitoringSummary.html

Urinary Mono-2-ethyl-5-carboxypentyl terephthalate (MECPTP) (2015 – 2016)

CAS Number 5393-19-1

Metabolite of Di-2-ethylhexyl terephthalate (DEHTP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	19.7 (16.9-23.1)	16.5 (14.2-20.0)	59.8 (50.3-70.6)	196 (155-226)	369 (291-500)	2970
Age 3-5 years (2015 - 2016)	39.7 (33.8-46.7)	38.6 (30.1-44.8)	72.8 (62.8-98.5)	207 (135-266)	282 (230-450)	465
Age 6-11 years (2015 - 2016)	41.4 (32.5-52.8)	38.2 (28.5-52.6)	100 (75.3-140)	228 (157-360)	401 (229-708)	413
Age 12-19 years (2015 - 2016)	38.1 (29.4-49.3)	32.1 (23.5-44.9)	123 (79.4-214)	373 (187-628)	628 (361-846)	403
Age 20+ years (2015 - 2016)	16.1 (13.6-19.1)	12.7 (11.0-15.4)	50.2 (37.1-64.1)	156 (127-210)	330 (234-502)	1689
Males (2015 - 2016)	20.7 (17.7-24.3)	17.8 (15.1-23.1)	62.9 (49.1-77.0)	190 (139-244)	374 (292-475)	1472
Females (2015 - 2016)	18.8 (15.7-22.5)	15.7 (12.6-19.6)	57.9 (47.8-69.0)	198 (151-229)	361 (255-532)	1498
Mexican Americans (2015 - 2016)	20.3 (14.7-27.9)	19.3 (13.5-30.0)	59.4 (41.6-80.0)	143 (113-192)	288 (186-401)	594
Non-Hispanic blacks (2015 - 2016)	25.8 (20.5-32.6)	24.1 (19.7-29.9)	73.1 (54.5-95.8)	211 (167-266)	343 (265-502)	697
Non-Hispanic whites (2015 - 2016)	19.4 (16.0-23.7)	15.6 (12.4-20.3)	60.1 (49.1-78.5)	218 (148-282)	404 (291-600)	861
All Hispanics (2015 - 2016)	19.1 (14.2-25.9)	17.9 (12.9-25.2)	58.8 (41.9-75.6)	156 (117-192)	288 (192-401)	969
Asians (2015 - 2016)	17.4 (11.6-26.1)	15.2 (12.1-20.2)	47.6 (33.5-77.1)	145 (78.6-351)	380 (124-665)	301

Limit of detection (LOD, see Data Analysis section) for Survey year 15-16 is 0.2.

Urinary Mono-2-ethyl-5-carboxypentyl terephthalate (MECPTP) (creatinine corrected) (2015 – 2016)

CAS Number 5393-19-1

Metabolite of Di-2-ethylhexyl terephthalate (DEHTP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	20.4 (17.5-23.9)	18.1 (14.4-21.9)	58.8 (49.5-68.7)	166 (147-199)	361 (277-410)	2969
Age 3-5 years (2015 - 2016)	95.1 (79.2-114)	86.8 (67.5-107)	175 (143-217)	397 (304-537)	716 (413-1080)	464
Age 6-11 years (2015 - 2016)	53.5 (44.5-64.3)	49.0 (42.0-60.4)	109 (82.2-138)	253 (183-339)	443 (302-710)	413
Age 12-19 years (2015 - 2016)	29.6 (23.2-37.8)	23.7 (16.4-35.4)	88.6 (52.3-144)	244 (206-305)	395 (302-455)	403
Age 20+ years (2015 - 2016)	16.4 (13.8-19.5)	13.8 (11.8-17.2)	45.5 (36.1-57.5)	145 (111-162)	290 (201-395)	1689
Males (2015 - 2016)	18.5 (15.6-21.8)	15.5 (12.6-19.6)	54.8 (41.8-74.9)	148 (133-192)	302 (218-368)	1472
Females (2015 - 2016)	22.5 (18.9-26.9)	20.3 (15.6-24.3)	61.1 (56.7-73.5)	182 (149-241)	426 (251-487)	1497
Mexican Americans (2015 - 2016)	22.1 (15.8-30.9)	22.5 (13.4-36.1)	63.6 (45.0-85.2)	166 (102-220)	294 (174-395)	594
Non-Hispanic blacks (2015 - 2016)	20.6 (16.9-25.1)	18.4 (13.6-24.4)	58.1 (45.1-77.8)	142 (108-188)	290 (204-364)	696
Non-Hispanic whites (2015 - 2016)	20.9 (17.1-25.5)	18.5 (14.0-23.2)	59.7 (47.7-76.7)	197 (149-244)	426 (253-494)	861
All Hispanics (2015 - 2016)	20.2 (15.1-27.0)	19.0 (13.1-27.1)	59.8 (42.8-80.0)	153 (110-212)	282 (180-395)	969
Asians (2015 - 2016)	21.5 (15.7-29.5)	19.5 (12.9-27.6)	53.0 (30.4-93.7)	159 (80.5-232)	235 (138-602)	301

Urinary Mono-2-ethyl-5-hydroxyhexyl terephthalate (MEHHTP) (2015 – 2016)

CAS Number 5393-19-1

Metabolite of Di-2-ethylhexyl terephthalate (DEHTP)

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	5.15 (4.41-6.02)	4.60 (3.90-5.30)	13.8 (11.8-16.9)	42.3 (30.0-55.1)	85.7 (61.4-124)	2970
Age 3-5 years (2015 - 2016)	5.74 (4.90-6.73)	5.20 (4.30-6.30)	10.8 (8.90-14.2)	28.1 (19.4-37.5)	45.2 (30.8-59.2)	465
Age 6-11 years (2015 - 2016)	7.35 (5.70-9.48)	7.00 (5.20-10.0)	16.0 (12.6-22.5)	34.6 (23.0-63.1)	74.7 (34.6-111)	413
Age 12-19 years (2015 - 2016)	8.11 (6.24-10.5)	7.30 (5.90-9.50)	23.5 (13.9-35.6)	70.2 (33.1-144)	126 (54.5-209)	403
Age 20+ years (2015 - 2016)	4.63 (3.90-5.49)	3.80 (3.20-4.80)	12.9 (10.2-16.4)	40.0 (25.6-55.1)	85.7 (58.1-126)	1689
Males (2015 - 2016)	5.85 (4.89-6.99)	5.20 (4.20-6.60)	16.0 (12.3-20.0)	44.3 (30.0-63.5)	95.0 (65.1-144)	1472
Females (2015 - 2016)	4.56 (3.88-5.36)	3.80 (3.20-4.70)	12.5 (10.5-15.1)	40.0 (26.8-54.5)	78.4 (52.1-124)	1498
Mexican Americans (2015 - 2016)	4.75 (3.39-6.65)	4.60 (3.00-6.40)	12.3 (8.10-19.2)	34.0 (21.9-49.3)	58.1 (40.7-98.0)	594
Non-Hispanic blacks (2015 - 2016)	6.00 (4.78-7.53)	5.90 (4.50-7.40)	15.3 (11.5-20.0)	39.6 (29.4-53.9)	72.4 (56.3-101)	697
Non-Hispanic whites (2015 - 2016)	5.32 (4.45-6.37)	4.50 (3.60-5.50)	16.0 (12.3-19.9)	46.5 (30.0-76.0)	111 (71.1-156)	861
All Hispanics (2015 - 2016)	4.56 (3.39-6.13)	4.40 (3.10-5.80)	11.9 (8.50-15.7)	30.8 (22.9-47.6)	58.1 (44.5-94.4)	969
Asians (2015 - 2016)	4.30 (2.90-6.38)	3.90 (2.90-5.30)	10.8 (6.30-15.0)	27.1 (14.2-87.9)	68.6 (24.6-187)	301

Limit of detection (LOD, see Data Analysis section) for Survey year 15-16 is 0.4.

Urinary Mono-2-ethyl-5-hydroxyhexyl terephthalate (MEHHTP) (creatinine corrected) (2015 – 2016)

CAS Number 5393-19-1

Metabolite of Di-2-ethylhexyl terephthalate (DEHTP)

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	5.33 (4.58-6.21)	4.47 (3.72-5.39)	12.3 (10.3-15.6)	34.6 (26.9-46.4)	67.5 (52.8-84.1)	2969
Age 3-5 years (2015 - 2016)	13.7 (11.4-16.6)	12.5 (10.6-14.6)	24.5 (19.5-28.9)	58.6 (36.4-81.9)	89.2 (60.2-118)	464
Age 6-11 years (2015 - 2016)	9.50 (7.72-11.7)	8.86 (7.13-11.2)	16.9 (14.1-20.6)	41.5 (27.6-57.8)	64.3 (47.3-123)	413
Age 12-19 years (2015 - 2016)	6.30 (5.00-7.95)	5.66 (3.54-7.99)	16.9 (10.7-25.5)	44.2 (27.6-59.5)	59.5 (44.3-71.8)	403
Age 20+ years (2015 - 2016)	4.72 (3.97-5.60)	3.76 (3.22-4.68)	10.5 (8.07-14.6)	30.9 (23.6-44.6)	67.5 (50.2-84.1)	1689
Males (2015 - 2016)	5.22 (4.38-6.21)	4.66 (3.63-5.69)	12.0 (9.32-16.0)	33.1 (25.2-46.4)	64.9 (47.2-81.9)	1472
Females (2015 - 2016)	5.45 (4.66-6.39)	4.39 (3.67-5.56)	13.4 (10.5-15.9)	36.1 (26.3-51.5)	73.4 (47.1-95.4)	1497
Mexican Americans (2015 - 2016)	5.18 (3.66-7.33)	4.77 (2.78-8.42)	12.3 (8.67-18.8)	27.6 (21.4-41.4)	52.0 (27.0-123)	594
Non-Hispanic blacks (2015 - 2016)	4.78 (4.04-5.65)	4.18 (3.29-5.67)	10.8 (8.60-13.2)	26.7 (21.4-34.8)	50.7 (34.0-69.9)	696
Non-Hispanic whites (2015 - 2016)	5.72 (4.79-6.84)	4.88 (3.81-5.92)	14.1 (10.2-18.8)	44.3 (32.4-52.5)	79.8 (57.8-101)	861
All Hispanics (2015 - 2016)	4.81 (3.62-6.38)	4.32 (2.93-6.58)	11.5 (8.28-16.9)	27.8 (21.4-40.2)	50.2 (33.1-85.9)	969
Asians (2015 - 2016)	5.33 (3.95-7.17)	4.30 (3.03-5.76)	11.1 (8.12-17.2)	31.8 (17.7-59.5)	59.5 (30.5-118)	301

Urinary Daidzein (1999 – 2010)‡

CAS Number 486-66-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	75.1 (61.9-91.1)	69.8 (57.8-82.6)	229 (184-298)	538 (471-702)	1320 (1020-1540)	2553
Total population (2001 - 2002)	51.7 (46.6-57.5)	52.3 (48.9-57.4)	192 (151-226)	577 (447-725)	1250 (863-1640)	2794
Total population (2003 - 2004)	66.7 (60.4-73.7)	62.0 (54.1-69.7)	195 (171-219)	590 (500-675)	1070 (893-1330)	2594
Total population (2005 - 2006)	66.5 (59.7-74.1)	58.8 (51.0-67.7)	204 (187-226)	648 (485-745)	1180 (1000-1350)	2528
Total population (2007 - 2008)	67.1 (60.2-74.8)	57.6 (49.1-66.0)	203 (182-222)	747 (551-994)	1740 (1210-2240)	2424
Total population (2009 - 2010)	69.3 (61.6-77.9)	57.2 (48.8-64.3)	228 (190-262)	753 (671-880)	1850 (1380-2480)	2792
Age 6-11 years (1999 - 2000)	90.5 (75.1-109)	101 (70.3-138)	257 (172-430)	510 (437-840)	1130 (657-1740)	330
Age 6-11 years (2001 - 2002)	84.9 (71.6-101)	72.7 (56.3-97.0)	261 (155-385)	605 (437-989)	1060 (645-1500)	396
Age 6-11 years (2003 - 2004)	84.9 (71.6-101)	66.8 (55.4-92.8)	229 (151-314)	574 (371-654)	818 (625-1060)	341
Age 6-11 years (2005 - 2006)	94.1 (74.3-119)	74.0 (56.0-95.9)	287 (149-471)	1010 (557-1600)	1870 (1040-3830)	351
Age 6-11 years (2007 - 2008)	105 (80.2-137)	90.6 (61.4-123)	277 (183-431)	1370 (491-2190)	2190 (1340-3500)	360
Age 6-11 years (2009 - 2010)	109 (88.1-135)	98.5 (75.4-119)	461 (262-605)	1000 (730-1520)	1900 (1120-2800)	371
Age 12-19 years (1999 - 2000)	123 (91.4-166)	124 (85.6-168)	326 (227-454)	833 (445-1490)	1460 (861-2410)	753
Age 12-19 years (2001 - 2002)	69.3 (52.6-91.3)	70.2 (52.5-87.5)	255 (185-344)	774 (573-984)	1360 (922-1950)	744
Age 12-19 years (2003 - 2004)	89.0 (75.2-105)	78.0 (59.0-104)	248 (197-332)	808 (500-968)	1200 (900-1790)	729
Age 12-19 years (2005 - 2006)	94.4 (76.0-117)	77.1 (59.7-103)	286 (200-416)	836 (530-1170)	1390 (929-2220)	693
Age 12-19 years (2007 - 2008)	79.7 (64.4-98.6)	76.0 (52.2-107)	256 (189-300)	828 (396-1100)	1220 (874-2070)	375
Age 12-19 years (2009 - 2010)	94.2 (74.1-120)	82.9 (60.8-116)	295 (201-395)	1020 (690-1210)	1390 (1150-2500)	447
Age 20+ years (1999 - 2000)	67.6 (55.4-82.4)	60.9 (49.3-74.1)	215 (167-239)	518 (459-573)	1320 (978-1540)	1470
Age 20+ years (2001 - 2002)	46.4 (41.4-52.0)	49.1 (40.8-53.4)	176 (133-216)	520 (396-703)	1210 (771-1900)	1654
Age 20+ years (2003 - 2004)	61.9 (55.2-69.4)	57.9 (48.7-68.5)	180 (150-214)	554 (416-695)	1110 (857-1360)	1524
Age 20+ years (2005 - 2006)	60.5 (53.4-68.7)	54.0 (46.8-63.8)	197 (169-209)	512 (427-664)	1100 (795-1270)	1484
Age 20+ years (2007 - 2008)	62.2 (55.0-70.4)	51.7 (44.3-60.3)	189 (169-211)	686 (514-939)	1640 (1060-2500)	1689
Age 20+ years (2009 - 2010)	63.0 (54.7-72.5)	49.3 (43.0-59.8)	203 (168-250)	701 (572-856)	1980 (1220-2780)	1974
Males (1999 - 2000)	88.9 (71.4-111)	80.6 (66.6-112)	262 (198-355)	587 (501-989)	1540 (989-2080)	1220
Males (2001 - 2002)	49.8 (42.8-57.9)	50.8 (46.0-55.0)	190 (137-240)	498 (386-694)	920 (717-1380)	1375
Males (2003 - 2004)	73.8 (63.4-85.9)	65.2 (56.1-76.4)	214 (156-311)	709 (535-900)	1200 (969-1380)	1244
Males (2005 - 2006)	73.9 (65.3-83.6)	66.4 (53.8-78.5)	210 (180-241)	694 (471-823)	1180 (979-1400)	1252
Males (2007 - 2008)	72.7 (62.2-85.0)	63.4 (49.3-76.5)	210 (174-259)	706 (520-1180)	2010 (1210-3520)	1198
Males (2009 - 2010)	68.8 (59.0-80.3)	55.0 (46.0-65.0)	207 (168-257)	674 (559-840)	1430 (1160-2370)	1377
Females (1999 - 2000)	64.1 (52.9-77.6)	57.8 (45.0-73.2)	199 (150-244)	476 (389-722)	1220 (566-1700)	1333
Females (2001 - 2002)	53.6 (48.1-59.8)	55.7 (49.8-62.7)	199 (149-234)	642 (511-816)	1470 (1170-1980)	1419
Females (2003 - 2004)	60.7 (53.6-68.8)	57.4 (49.1-67.6)	175 (159-201)	466 (381-622)	884 (654-1380)	1350
Females (2005 - 2006)	60.1 (52.5-68.9)	52.5 (45.0-61.1)	200 (166-231)	587 (420-717)	1140 (811-1440)	1276
Females (2007 - 2008)	62.2 (54.4-71.0)	52.2 (44.4-58.7)	191 (169-217)	752 (476-905)	1570 (994-2180)	1226
Females (2009 - 2010)	69.8 (60.7-80.3)	60.2 (46.1-71.1)	249 (200-309)	840 (694-973)	2140 (1210-2910)	1415

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.5, 1.6, 0.3, 0.4, 0.4, and 0.4 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Daidzein (1999 – 2010)‡

CAS Number 486-66-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	78.9 (59.8-104)	66.2 (48.4-87.1)	254 (170-402)	806 (534-1020)	1360 (968-2780)	816
Mexican Americans (2001 - 2002)	39.2 (28.5-54.0)	39.9 (28.8-59.9)	169 (100-291)	515 (388-669)	896 (613-1480)	679
Mexican Americans (2003 - 2004)	57.4 (50.2-65.7)	45.5 (35.2-53.3)	178 (130-236)	686 (487-934)	1390 (934-1650)	653
Mexican Americans (2005 - 2006)	60.6 (53.3-68.9)	54.1 (44.3-65.2)	193 (155-239)	671 (424-966)	1350 (966-1550)	634
Mexican Americans (2007 - 2008)	60.5 (46.6-78.6)	45.8 (34.4-67.3)	206 (143-313)	815 (510-1010)	1410 (994-2010)	520
Mexican Americans (2009 - 2010)	60.6 (48.8-75.2)	48.8 (38.6-74.3)	219 (142-283)	622 (495-853)	1190 (884-1570)	604
Non-Hispanic blacks (1999 - 2000)	91.9 (71.9-118)	103 (81.6-133)	286 (243-377)	553 (459-824)	1190 (640-1900)	607
Non-Hispanic blacks (2001 - 2002)	66.1 (48.2-90.7)	72.9 (52.8-97.3)	255 (182-393)	757 (448-1400)	1410 (757-2480)	706
Non-Hispanic blacks (2003 - 2004)	75.0 (56.1-100)	66.0 (50.7-86.6)	241 (151-340)	622 (408-875)	1190 (660-2300)	699
Non-Hispanic blacks (2005 - 2006)	81.3 (71.6-92.4)	76.5 (64.7-97.1)	254 (199-331)	676 (463-874)	1210 (760-1790)	662
Non-Hispanic blacks (2007 - 2008)	84.0 (63.3-111)	69.8 (43.4-102)	338 (248-419)	1080 (735-1500)	2180 (1230-2610)	562
Non-Hispanic blacks (2009 - 2010)	77.2 (64.6-92.1)	69.9 (58.1-82.6)	229 (192-281)	711 (534-1080)	1350 (894-3480)	534
Non-Hispanic whites (1999 - 2000)	74.4 (61.5-89.9)	66.9 (56.2-78.2)	216 (157-298)	512 (438-745)	1360 (989-1710)	917
Non-Hispanic whites (2001 - 2002)	48.6 (43.8-54.0)	49.8 (42.8-54.2)	171 (137-204)	504 (389-658)	1140 (774-1620)	1222
Non-Hispanic whites (2003 - 2004)	65.8 (58.6-74.0)	62.0 (52.8-71.9)	191 (165-215)	572 (416-722)	1070 (823-1330)	1079
Non-Hispanic whites (2005 - 2006)	62.0 (54.4-70.7)	54.2 (46.9-64.1)	200 (164-216)	581 (430-717)	1040 (811-1310)	1039
Non-Hispanic whites (2007 - 2008)	63.6 (56.8-71.2)	56.7 (46.2-65.0)	180 (158-212)	603 (455-832)	1430 (915-2170)	993
Non-Hispanic whites (2009 - 2010)	68.3 (58.2-80.2)	55.0 (45.5-66.8)	219 (168-284)	726 (584-887)	1740 (1150-2510)	1186

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.5, 1.6, 0.3, 0.4, 0.4, and 0.4 respectively. ‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Daidzein (creatinine corrected) (1999 – 2010)‡

CAS Number 486-66-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	68.5 (55.9-83.9)	65.1 (52.8-80.8)	204 (156-249)	560 (471-629)	944 (836-1150)	2553
Total population (2001 - 2002)	48.5 (43.7-54.0)	48.3 (43.1-56.5)	166 (140-196)	500 (391-608)	957 (801-1180)	2794
Total population (2003 - 2004)	62.5 (58.3-67.0)	56.1 (50.0-63.5)	164 (144-187)	502 (429-591)	1060 (825-1150)	2594
Total population (2005 - 2006)	64.8 (58.7-71.6)	52.4 (47.4-59.7)	184 (162-209)	564 (461-679)	1070 (896-1310)	2528
Total population (2007 - 2008)	67.5 (60.5-75.2)	55.6 (47.4-64.0)	197 (178-217)	672 (538-897)	1400 (1070-2250)	2424
Total population (2009 - 2010)	74.2 (67.0-82.2)	55.9 (51.6-61.7)	219 (184-272)	790 (688-1090)	1920 (1550-2390)	2791
Age 6-11 years (1999 - 2000)	92.6 (76.3-112)	93.1 (71.2-114)	251 (157-324)	552 (363-838)	1070 (781-2150)	330
Age 6-11 years (2001 - 2002)	96.4 (79.0-118)	85.9 (60.3-127)	275 (159-395)	655 (452-733)	938 (683-1140)	396
Age 6-11 years (2003 - 2004)	90.4 (77.2-106)	72.8 (58.1-99.5)	201 (152-240)	454 (329-638)	702 (526-1200)	341
Age 6-11 years (2005 - 2006)	104 (83.1-130)	73.8 (59.5-96.7)	305 (175-453)	1040 (686-1830)	2430 (1190-3630)	351
Age 6-11 years (2007 - 2008)	128 (101-164)	106 (80.0-141)	307 (197-429)	1420 (543-2630)	2630 (1380-3670)	360
Age 6-11 years (2009 - 2010)	149 (124-179)	128 (91.0-162)	500 (346-601)	1230 (814-1530)	2150 (1450-3070)	370
Age 12-19 years (1999 - 2000)	83.1 (58.4-118)	85.6 (53.8-126)	207 (138-386)	628 (295-1060)	1000 (628-2380)	753
Age 12-19 years (2001 - 2002)	53.4 (40.8-70.0)	50.9 (38.3-77.6)	181 (142-248)	549 (385-718)	1030 (622-1360)	744
Age 12-19 years (2003 - 2004)	66.6 (55.7-79.6)	56.4 (43.9-74.6)	179 (151-217)	517 (370-753)	877 (617-1240)	729
Age 12-19 years (2005 - 2006)	70.0 (56.9-86.2)	55.1 (42.9-74.3)	203 (149-263)	545 (338-845)	914 (659-1750)	693
Age 12-19 years (2007 - 2008)	61.3 (51.5-72.9)	61.9 (39.9-75.0)	191 (144-217)	470 (295-645)	821 (544-1110)	375
Age 12-19 years (2009 - 2010)	88.6 (71.3-110)	76.5 (53.6-107)	249 (177-312)	689 (522-969)	1410 (823-2740)	447
Age 20+ years (1999 - 2000)	63.8 (51.5-79.1)	59.3 (48.7-75.0)	194 (151-234)	554 (471-624)	908 (783-1180)	1470
Age 20+ years (2001 - 2002)	43.9 (39.4-48.9)	43.8 (37.4-53.3)	153 (125-186)	428 (348-590)	946 (728-1220)	1654
Age 20+ years (2003 - 2004)	59.2 (54.3-64.5)	51.7 (46.4-62.6)	155 (131-185)	501 (404-658)	1090 (808-1240)	1524
Age 20+ years (2005 - 2006)	60.7 (54.3-67.8)	50.6 (43.1-59.5)	171 (151-199)	483 (434-609)	1030 (847-1200)	1484
Age 20+ years (2007 - 2008)	63.9 (56.0-72.9)	49.2 (42.6-57.7)	187 (164-216)	675 (514-904)	1340 (962-2780)	1689
Age 20+ years (2009 - 2010)	67.1 (59.4-75.7)	50.3 (44.2-55.5)	194 (168-232)	775 (613-1120)	1980 (1550-2640)	1974
Males (1999 - 2000)	69.7 (54.7-88.8)	70.2 (51.3-84.3)	198 (147-276)	623 (494-836)	1050 (884-1290)	1220
Males (2001 - 2002)	40.5 (34.8-47.1)	41.7 (34.5-47.9)	139 (107-179)	348 (260-553)	788 (585-947)	1375
Males (2003 - 2004)	57.7 (49.4-67.3)	48.9 (41.6-58.2)	160 (126-205)	467 (368-600)	919 (665-1200)	1244
Males (2005 - 2006)	59.5 (53.3-66.3)	51.0 (43.2-57.6)	164 (134-203)	467 (403-612)	927 (781-1100)	1252
Males (2007 - 2008)	61.3 (52.5-71.7)	48.7 (41.5-63.2)	178 (141-205)	585 (412-845)	1290 (907-2810)	1198
Males (2009 - 2010)	62.8 (54.8-72.1)	49.9 (42.6-57.3)	174 (145-196)	613 (497-790)	1740 (1170-2570)	1376
Females (1999 - 2000)	67.4 (54.8-82.9)	62.7 (51.1-80.9)	207 (152-250)	509 (356-624)	850 (610-1410)	1333
Females (2001 - 2002)	57.6 (50.8-65.2)	59.5 (48.1-73.4)	191 (159-227)	615 (536-722)	1180 (924-1430)	1419
Females (2003 - 2004)	67.4 (60.8-74.9)	65.1 (54.6-73.4)	165 (143-191)	564 (409-699)	1090 (757-1370)	1350
Females (2005 - 2006)	70.4 (61.3-80.8)	57.1 (45.1-71.7)	194 (169-216)	609 (463-887)	1200 (957-1750)	1276
Females (2007 - 2008)	73.8 (64.9-84.0)	63.0 (52.1-77.2)	223 (190-259)	763 (577-1000)	1410 (1070-1990)	1226
Females (2009 - 2010)	87.2 (77.9-97.7)	64.1 (55.6-76.7)	292 (240-336)	972 (800-1230)	2280 (1560-2880)	1415

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Daidzein (creatinine corrected) (1999 – 2010)‡

CAS Number 486-66-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	72.5 (59.1-88.9)	64.2 (47.1-91.1)	243 (176-310)	677 (468-1080)	1380 (753-2690)	816
Mexican Americans (2001 - 2002)	36.9 (27.8-49.0)	37.1 (24.8-57.9)	146 (101-225)	441 (307-596)	722 (565-1160)	679
Mexican Americans (2003 - 2004)	51.8 (45.0-59.6)	47.7 (35.9-58.3)	159 (117-209)	502 (354-686)	1130 (779-1390)	653
Mexican Americans (2005 - 2006)	54.7 (45.6-65.7)	47.2 (35.7-61.1)	174 (136-219)	558 (380-617)	925 (642-1140)	634
Mexican Americans (2007 - 2008)	59.5 (44.1-80.1)	41.1 (27.4-76.1)	200 (150-288)	715 (502-1060)	1410 (1090-1860)	520
Mexican Americans (2009 - 2010)	63.7 (52.5-77.1)	49.2 (37.9-65.4)	213 (167-273)	614 (487-861)	1380 (865-1940)	604
Non-Hispanic blacks (1999 - 2000)	59.1 (46.5-75.1)	67.6 (52.1-87.1)	172 (134-207)	381 (316-533)	802 (562-1010)	607
Non-Hispanic blacks (2001 - 2002)	46.4 (33.7-63.8)	49.8 (35.5-69.7)	169 (104-249)	504 (263-773)	939 (542-1530)	706
Non-Hispanic blacks (2003 - 2004)	53.1 (42.5-66.4)	44.7 (28.6-72.1)	147 (121-191)	415 (275-538)	727 (538-1040)	699
Non-Hispanic blacks (2005 - 2006)	57.0 (50.3-64.5)	48.5 (40.3-59.7)	157 (124-221)	467 (370-654)	913 (603-1290)	662
Non-Hispanic blacks (2007 - 2008)	65.0 (48.7-86.6)	53.0 (36.0-80.6)	240 (171-292)	728 (520-937)	1330 (800-2670)	562
Non-Hispanic blacks (2009 - 2010)	62.1 (53.0-72.8)	55.7 (42.7-65.0)	179 (157-223)	576 (457-690)	956 (710-1840)	533
Non-Hispanic whites (1999 - 2000)	72.8 (60.3-88.0)	67.5 (55.3-81.5)	207 (160-249)	560 (442-659)	908 (742-1350)	917
Non-Hispanic whites (2001 - 2002)	48.1 (43.4-53.3)	47.0 (42.0-56.0)	163 (137-191)	463 (375-627)	957 (805-1220)	1222
Non-Hispanic whites (2003 - 2004)	64.9 (59.8-70.3)	58.2 (50.4-66.3)	165 (138-204)	516 (385-667)	1090 (786-1250)	1079
Non-Hispanic whites (2005 - 2006)	65.2 (57.9-73.3)	52.7 (46.5-60.7)	184 (155-211)	564 (443-737)	1070 (894-1390)	1039
Non-Hispanic whites (2007 - 2008)	66.2 (58.4-75.1)	57.7 (46.0-65.5)	187 (160-216)	604 (474-763)	1210 (907-1670)	993
Non-Hispanic whites (2009 - 2010)	76.6 (67.1-87.4)	56.7 (51.2-64.1)	225 (173-306)	809 (617-1180)	1920 (1410-2470)	1186

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Enterodiol (1999 – 2010)‡

CAS Number 80226-00-2

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	26.6 (21.9-32.3)	34.0 (29.4-38.7)	78.8 (62.6-95.5)	165 (135-215)	266 (215-335)	2527
Total population (2001 - 2002)	35.7 (32.5-39.3)	39.4 (36.3-43.4)	89.2 (80.7-96.9)	181 (162-205)	253 (223-308)	2794
Total population (2003 - 2004)	39.5 (36.1-43.3)	44.9 (40.6-50.3)	106 (97.2-115)	242 (212-264)	367 (311-423)	2594
Total population (2005 - 2006)	37.7 (33.2-42.9)	42.4 (39.4-47.2)	106 (95.5-120)	244 (226-266)	379 (305-440)	2528
Total population (2007 - 2008)	36.8 (32.0-42.4)	43.5 (37.8-49.2)	109 (92.1-124)	238 (199-294)	429 (279-723)	2424
Total population (2009 - 2010)	39.5 (36.3-43.1)	44.5 (41.0-48.5)	107 (98.4-120)	264 (226-288)	545 (446-651)	2792
Age 6-11 years (1999 - 2000)	26.5 (17.1-41.0)	29.4 (21.2-44.2)	78.7 (44.2-109)	215 (91.1-279)	276 (131-458)	327
Age 6-11 years (2001 - 2002)	33.6 (29.8-37.8)	35.5 (29.4-43.7)	78.1 (63.8-87.0)	152 (113-171)	203 (167-327)	396
Age 6-11 years (2003 - 2004)	42.0 (34.5-51.1)	42.1 (34.4-49.2)	91.4 (74.4-110)	199 (126-289)	312 (217-525)	341
Age 6-11 years (2005 - 2006)	33.2 (26.1-42.3)	38.5 (34.7-43.2)	70.4 (55.7-91.7)	129 (99.1-162)	181 (129-366)	351
Age 6-11 years (2007 - 2008)	38.5 (30.1-49.3)	42.9 (31.3-55.3)	80.4 (62.7-118)	181 (119-318)	318 (186-439)	360
Age 6-11 years (2009 - 2010)	38.6 (33.9-44.0)	39.9 (32.5-44.2)	88.8 (67.7-106)	195 (131-265)	277 (210-380)	371
Age 12-19 years (1999 - 2000)	29.8 (23.8-37.2)	34.0 (27.4-42.0)	84.4 (59.1-101)	166 (112-234)	253 (182-337)	744
Age 12-19 years (2001 - 2002)	35.3 (30.5-40.9)	37.7 (34.8-43.4)	84.2 (72.1-96.9)	165 (128-206)	238 (169-343)	744
Age 12-19 years (2003 - 2004)	45.1 (39.4-51.6)	46.3 (38.7-56.9)	99.5 (84.9-109)	191 (161-269)	325 (275-415)	729
Age 12-19 years (2005 - 2006)	39.1 (34.0-45.0)	41.1 (36.8-46.5)	92.0 (80.2-109)	193 (151-238)	265 (231-303)	693
Age 12-19 years (2007 - 2008)	37.3 (29.5-47.2)	45.8 (32.2-54.1)	97.9 (73.4-126)	199 (151-253)	293 (212-483)	375
Age 12-19 years (2009 - 2010)	37.5 (30.4-46.2)	38.3 (32.5-50.7)	98.0 (72.3-119)	184 (122-286)	315 (177-820)	447
Age 20+ years (1999 - 2000)	26.1 (21.8-31.3)	34.3 (29.8-38.7)	78.3 (63.5-94.8)	160 (132-196)	263 (189-335)	1456
Age 20+ years (2001 - 2002)	36.1 (31.8-41.0)	40.4 (36.0-45.7)	91.2 (79.3-105)	190 (161-220)	256 (224-312)	1654
Age 20+ years (2003 - 2004)	38.4 (34.2-43.0)	44.9 (40.1-51.9)	112 (98.8-125)	255 (215-274)	398 (320-448)	1524
Age 20+ years (2005 - 2006)	38.1 (32.7-44.4)	43.8 (39.0-49.5)	116 (103-130)	266 (242-281)	413 (326-479)	1484
Age 20+ years (2007 - 2008)	36.5 (31.2-42.8)	43.5 (37.6-49.3)	116 (97.5-130)	247 (194-326)	473 (300-757)	1689
Age 20+ years (2009 - 2010)	40.0 (36.2-44.1)	47.6 (42.2-53.0)	114 (101-130)	277 (230-366)	596 (460-746)	1974
Males (1999 - 2000)	25.3 (19.5-32.7)	33.0 (28.0-38.0)	72.6 (54.7-94.3)	149 (109-219)	258 (169-286)	1206
Males (2001 - 2002)	35.2 (31.8-39.1)	40.5 (36.8-44.8)	90.6 (82.3-103)	184 (158-198)	263 (223-338)	1375
Males (2003 - 2004)	39.7 (36.2-43.6)	45.1 (40.5-51.1)	102 (92.9-115)	231 (186-266)	361 (268-460)	1244
Males (2005 - 2006)	40.4 (32.8-49.8)	46.2 (38.9-52.3)	107 (90.6-127)	264 (227-289)	413 (287-496)	1252
Males (2007 - 2008)	33.1 (28.6-38.2)	39.8 (34.7-43.3)	91.8 (78.6-116)	216 (180-242)	378 (238-738)	1198
Males (2009 - 2010)	37.4 (30.9-45.3)	41.7 (35.5-48.4)	94.7 (78.9-111)	227 (173-312)	476 (366-664)	1377
Females (1999 - 2000)	27.9 (23.4-33.3)	36.0 (29.9-40.3)	84.4 (71.8-97.9)	177 (146-219)	280 (219-375)	1321
Females (2001 - 2002)	36.2 (32.2-40.7)	38.5 (35.3-43.4)	87.0 (75.6-98.5)	175 (152-212)	248 (220-283)	1419
Females (2003 - 2004)	39.3 (33.8-45.5)	44.9 (38.3-53.0)	110 (97.3-124)	250 (203-294)	398 (309-464)	1350
Females (2005 - 2006)	35.4 (30.3-41.2)	41.1 (35.6-45.4)	106 (94.2-123)	225 (186-267)	352 (268-477)	1276
Females (2007 - 2008)	40.7 (33.0-50.2)	48.4 (39.3-58.1)	123 (101-145)	258 (206-336)	479 (311-757)	1226
Females (2009 - 2010)	41.7 (37.6-46.3)	48.9 (41.6-56.7)	123 (111-140)	277 (243-304)	553 (448-778)	1415

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.8, 1.5, 0.3, 0.04, 0.04, and 0.04 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Enterodiol (1999 – 2010)‡

CAS Number 80226-00-2

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	21.7 (19.5-24.1)	28.0 (24.7-34.7)	70.4 (60.8-78.8)	143 (117-169)	213 (169-256)	791
Mexican Americans (2001 - 2002)	30.5 (25.7-36.3)	34.0 (29.0-39.2)	75.9 (58.8-89.7)	159 (119-202)	244 (192-298)	679
Mexican Americans (2003 - 2004)	33.1 (26.4-41.6)	38.7 (31.2-47.6)	95.2 (78.1-115)	198 (125-307)	307 (186-480)	653
Mexican Americans (2005 - 2006)	38.1 (32.2-45.1)	40.6 (34.6-47.6)	102 (86.8-123)	262 (177-359)	383 (289-511)	634
Mexican Americans (2007 - 2008)	28.2 (24.8-32.0)	29.7 (26.7-33.4)	70.8 (59.9-83.8)	173 (139-208)	305 (207-456)	520
Mexican Americans (2009 - 2010)	27.9 (24.5-31.7)	31.1 (28.8-36.7)	75.5 (66.6-85.5)	157 (120-192)	255 (174-408)	604
Non-Hispanic blacks (1999 - 2000)	25.8 (21.7-30.7)	31.2 (24.4-35.9)	66.0 (50.2-86.7)	157 (122-193)	260 (185-336)	608
Non-Hispanic blacks (2001 - 2002)	35.0 (28.9-42.3)	38.7 (33.2-49.2)	83.7 (70.0-103)	169 (132-191)	225 (175-339)	706
Non-Hispanic blacks (2003 - 2004)	40.4 (34.9-46.7)	47.1 (40.4-53.7)	100 (81.3-123)	212 (157-254)	293 (232-417)	699
Non-Hispanic blacks (2005 - 2006)	34.7 (30.1-40.1)	38.4 (32.6-44.7)	85.1 (70.9-109)	190 (137-242)	269 (245-364)	662
Non-Hispanic blacks (2007 - 2008)	34.4 (26.9-44.0)	38.9 (28.9-48.5)	95.7 (78.5-126)	202 (147-252)	327 (232-514)	562
Non-Hispanic blacks (2009 - 2010)	32.4 (27.3-38.4)	35.7 (30.4-42.3)	98.5 (76.2-126)	211 (178-245)	307 (221-546)	534
Non-Hispanic whites (1999 - 2000)	29.2 (24.0-35.4)	37.6 (31.3-43.8)	85.8 (68.3-99.4)	171 (138-228)	270 (187-375)	915
Non-Hispanic whites (2001 - 2002)	35.6 (31.8-40.0)	40.4 (36.1-44.7)	89.6 (78.5-101)	175 (153-198)	254 (214-337)	1222
Non-Hispanic whites (2003 - 2004)	39.8 (35.5-44.7)	45.8 (38.9-54.9)	109 (95.8-126)	255 (206-267)	365 (294-424)	1079
Non-Hispanic whites (2005 - 2006)	37.3 (31.2-44.6)	42.6 (37.1-50.1)	108 (94.0-127)	243 (219-267)	371 (285-456)	1039
Non-Hispanic whites (2007 - 2008)	39.1 (31.5-48.5)	46.8 (39.3-55.5)	116 (91.8-140)	257 (188-369)	444 (269-839)	993
Non-Hispanic whites (2009 - 2010)	44.1 (39.0-49.9)	51.7 (44.2-56.7)	114 (100-129)	277 (236-311)	596 (414-778)	1186

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.8, 1.5, 0.3, 0.04, 0.04, and 0.04 respectively.‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Enterodiol (creatinine corrected) (1999 – 2010)‡

CAS Number 80226-00-2

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	24.2 (20.3-28.9)	29.9 (25.0-34.7)	70.5 (59.6-82.1)	146 (124-177)	240 (199-320)	2527
Total population (2001 - 2002)	33.5 (30.7-36.7)	37.6 (33.0-42.1)	79.2 (72.6-87.3)	149 (136-164)	224 (197-250)	2794
Total population (2003 - 2004)	37.0 (33.6-40.7)	41.7 (37.9-45.4)	95.9 (85.6-106)	194 (171-213)	294 (247-368)	2594
Total population (2005 - 2006)	36.8 (32.7-41.4)	41.0 (35.9-46.3)	103 (94.3-114)	204 (174-219)	323 (280-424)	2528
Total population (2007 - 2008)	37.0 (32.3-42.3)	42.1 (36.8-48.1)	103 (87.1-117)	224 (164-328)	395 (292-634)	2424
Total population (2009 - 2010)	42.3 (38.9-46.1)	47.1 (44.9-49.8)	108 (101-117)	281 (234-333)	522 (415-602)	2791
Age 6-11 years (1999 - 2000)	27.0 (18.6-39.3)	33.7 (21.8-43.7)	62.7 (43.0-108)	168 (81.6-290)	290 (150-411)	327
Age 6-11 years (2001 - 2002)	38.1 (32.5-44.7)	39.3 (30.8-53.1)	78.3 (66.6-103)	188 (147-244)	304 (242-389)	396
Age 6-11 years (2003 - 2004)	44.7 (37.4-53.5)	46.6 (38.5-58.3)	93.3 (73.9-125)	177 (128-205)	215 (181-413)	341
Age 6-11 years (2005 - 2006)	36.6 (28.9-46.4)	37.8 (32.3-46.5)	75.6 (60.9-105)	156 (109-219)	223 (165-326)	351
Age 6-11 years (2007 - 2008)	47.2 (37.5-59.4)	48.0 (38.0-65.2)	86.3 (67.9-178)	230 (181-297)	335 (230-854)	360
Age 6-11 years (2009 - 2010)	52.6 (45.0-61.4)	54.3 (39.8-64.5)	104 (79.5-139)	235 (145-335)	336 (239-413)	370
Age 12-19 years (1999 - 2000)	20.1 (16.7-24.2)	24.1 (19.6-30.1)	55.1 (42.6-71.7)	99.5 (91.5-116)	158 (121-177)	744
Age 12-19 years (2001 - 2002)	27.2 (23.3-31.8)	28.7 (24.9-34.9)	62.7 (54.9-71.0)	104 (84.2-139)	152 (111-225)	744
Age 12-19 years (2003 - 2004)	33.8 (30.3-37.7)	34.8 (33.2-38.8)	67.6 (64.1-73.9)	130 (107-164)	221 (138-324)	729
Age 12-19 years (2005 - 2006)	29.0 (25.2-33.3)	31.4 (27.8-36.1)	68.8 (57.7-80.7)	131 (113-160)	167 (160-216)	693
Age 12-19 years (2007 - 2008)	28.7 (22.3-36.9)	33.8 (25.1-43.3)	73.4 (52.9-99.3)	131 (100-207)	207 (128-280)	375
Age 12-19 years (2009 - 2010)	35.3 (29.5-42.1)	37.8 (29.7-44.1)	81.7 (66.9-101)	170 (111-303)	306 (170-763)	447
Age 20+ years (1999 - 2000)	24.7 (20.6-29.5)	30.6 (26.0-34.8)	73.0 (62.5-84.5)	157 (129-184)	242 (199-344)	1456
Age 20+ years (2001 - 2002)	34.2 (30.3-38.5)	39.6 (32.5-45.3)	84.1 (73.8-93.3)	152 (136-169)	224 (193-250)	1654
Age 20+ years (2003 - 2004)	36.7 (32.5-41.4)	42.0 (37.1-47.8)	103 (91.8-111)	205 (173-239)	327 (256-431)	1524
Age 20+ years (2005 - 2006)	38.2 (33.1-44.0)	43.1 (36.4-49.4)	111 (96.0-128)	216 (187-242)	358 (291-475)	1484
Age 20+ years (2007 - 2008)	37.5 (32.2-43.7)	42.5 (36.8-49.9)	109 (90.7-134)	242 (167-372)	447 (328-718)	1689
Age 20+ years (2009 - 2010)	42.6 (39.0-46.4)	48.3 (46.0-51.1)	113 (103-128)	303 (252-355)	579 (461-747)	1974
Males (1999 - 2000)	19.8 (15.4-25.4)	25.4 (20.0-31.4)	55.1 (46.4-64.2)	122 (94.6-168)	199 (145-282)	1206
Males (2001 - 2002)	28.7 (26.0-31.7)	31.4 (27.0-36.8)	71.3 (64.2-78.0)	136 (114-160)	212 (179-259)	1375
Males (2003 - 2004)	31.1 (27.5-35.0)	34.8 (32.3-38.5)	78.0 (68.8-92.7)	165 (128-211)	249 (187-361)	1244
Males (2005 - 2006)	32.5 (26.7-39.5)	34.2 (29.5-41.1)	90.9 (75.2-102)	192 (147-235)	311 (218-490)	1252
Males (2007 - 2008)	27.9 (23.9-32.6)	33.0 (28.5-38.6)	79.3 (72.4-87.1)	164 (122-234)	259 (172-499)	1198
Males (2009 - 2010)	34.2 (27.9-42.0)	39.0 (33.0-45.6)	80.9 (69.7-103)	197 (150-253)	345 (235-494)	1376
Females (1999 - 2000)	29.3 (25.0-34.4)	35.4 (29.5-41.6)	85.2 (74.5-92.3)	165 (141-201)	321 (226-370)	1321
Females (2001 - 2002)	38.9 (34.9-43.3)	43.9 (39.3-48.7)	88.3 (74.7-102)	157 (139-174)	235 (180-304)	1419
Females (2003 - 2004)	43.6 (38.3-49.7)	49.0 (43.4-57.7)	109 (98.8-123)	215 (178-270)	377 (278-443)	1350
Females (2005 - 2006)	41.4 (36.1-47.4)	48.2 (41.8-55.7)	116 (98.0-131)	210 (183-231)	376 (235-470)	1276
Females (2007 - 2008)	48.4 (40.6-57.6)	53.2 (44.2-62.9)	128 (105-154)	300 (215-388)	529 (372-759)	1226
Females (2009 - 2010)	52.1 (46.7-58.1)	59.4 (49.4-66.2)	139 (121-156)	384 (311-450)	694 (526-938)	1415

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Enterodiol (creatinine corrected) (1999 – 2010)‡

CAS Number 80226-00-2

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	19.6 (17.3-22.2)	23.5 (19.7-28.7)	60.6 (49.8-77.7)	134 (114-154)	193 (154-227)	791
Mexican Americans (2001 - 2002)	28.7 (24.5-33.7)	31.0 (27.0-37.3)	64.1 (55.0-77.5)	133 (94.4-183)	223 (143-337)	679
Mexican Americans (2003 - 2004)	29.9 (23.8-37.4)	34.0 (26.5-42.8)	74.1 (62.0-101)	176 (118-234)	241 (189-364)	653
Mexican Americans (2005 - 2006)	34.4 (28.3-41.8)	35.3 (30.7-40.0)	84.6 (71.2-110)	200 (145-271)	315 (221-515)	634
Mexican Americans (2007 - 2008)	27.7 (24.5-31.3)	29.5 (23.9-33.8)	75.9 (61.3-88.2)	169 (124-198)	240 (178-387)	520
Mexican Americans (2009 - 2010)	29.3 (25.8-33.3)	33.6 (29.5-38.0)	72.3 (61.4-82.7)	157 (116-193)	265 (193-351)	604
Non-Hispanic blacks (1999 - 2000)	16.6 (13.9-19.7)	18.8 (14.4-22.9)	47.3 (37.7-55.8)	113 (85.9-145)	169 (131-272)	608
Non-Hispanic blacks (2001 - 2002)	24.5 (19.7-30.6)	27.0 (22.6-33.3)	57.5 (48.2-73.2)	117 (92.2-143)	157 (118-246)	706
Non-Hispanic blacks (2003 - 2004)	28.6 (24.5-33.4)	30.4 (26.1-36.1)	68.3 (53.4-87.5)	126 (96.3-191)	203 (153-227)	699
Non-Hispanic blacks (2005 - 2006)	24.3 (20.5-28.9)	25.3 (22.1-30.4)	68.6 (50.3-86.0)	125 (110-147)	190 (139-245)	662
Non-Hispanic blacks (2007 - 2008)	26.6 (20.8-34.0)	30.0 (23.6-38.0)	62.9 (51.9-80.8)	139 (102-191)	257 (156-459)	562
Non-Hispanic blacks (2009 - 2010)	26.1 (22.1-30.8)	29.7 (25.5-35.9)	73.9 (56.7-88.3)	153 (115-191)	252 (191-339)	533
Non-Hispanic whites (1999 - 2000)	28.6 (24.3-33.6)	34.4 (28.9-39.3)	75.8 (65.3-87.2)	163 (130-197)	252 (203-363)	915
Non-Hispanic whites (2001 - 2002)	35.3 (31.6-39.4)	40.9 (34.3-46.8)	83.3 (74.7-90.3)	152 (136-173)	225 (189-275)	1222
Non-Hispanic whites (2003 - 2004)	39.3 (34.4-44.8)	45.5 (38.4-53.0)	105 (90.2-116)	202 (168-234)	299 (244-374)	1079
Non-Hispanic whites (2005 - 2006)	39.2 (33.3-46.1)	45.0 (39.4-50.2)	111 (96.2-124)	210 (175-235)	331 (277-439)	1039
Non-Hispanic whites (2007 - 2008)	40.7 (32.7-50.6)	46.4 (38.6-56.7)	109 (86.3-138)	240 (154-384)	424 (257-802)	993
Non-Hispanic whites (2009 - 2010)	49.5 (43.6-56.1)	53.5 (48.3-59.0)	123 (106-140)	325 (252-384)	572 (414-766)	1186

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Enterolactone (1999 – 2010)‡

CAS Number 77756-20-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	239 (200-286)	315 (245-381)	726 (595-879)	1970 (1440-2370)	2800 (2500-3140)	2548
Total population (2001 - 2002)	259 (233-287)	350 (314-389)	807 (739-873)	1590 (1440-1820)	2720 (1870-3430)	2794
Total population (2003 - 2004)	298 (265-334)	395 (331-464)	900 (819-969)	1790 (1560-2040)	2620 (2360-2880)	2594
Total population (2005 - 2006)	283 (245-327)	385 (338-460)	935 (824-1060)	1850 (1710-2040)	2880 (2480-3160)	2528
Total population (2007 - 2008)	242 (211-277)	311 (263-371)	876 (741-1010)	1740 (1480-2050)	2910 (2170-3320)	2424
Total population (2009 - 2010)	215 (193-240)	267 (229-306)	734 (659-853)	1760 (1490-2090)	2690 (2220-3160)	2792
Age 6-11 years (1999 - 2000)	308 (219-432)	356 (243-474)	721 (520-1320)	1730 (973-2840)	2840 (1700-3590)	331
Age 6-11 years (2001 - 2002)	288 (245-339)	329 (271-412)	680 (566-794)	1380 (929-1620)	2200 (1420-2550)	396
Age 6-11 years (2003 - 2004)	384 (287-513)	414 (299-567)	926 (589-1190)	1660 (1140-2280)	2360 (1700-3440)	341
Age 6-11 years (2005 - 2006)	300 (242-373)	399 (280-546)	851 (667-984)	1390 (1000-1770)	1910 (1390-2460)	351
Age 6-11 years (2007 - 2008)	255 (203-320)	314 (247-418)	706 (547-882)	1340 (897-1610)	1730 (1150-2600)	360
Age 6-11 years (2009 - 2010)	255 (206-316)	275 (209-346)	666 (552-749)	1480 (1180-1720)	1870 (1500-2870)	371
Age 12-19 years (1999 - 2000)	250 (191-327)	317 (242-410)	672 (454-888)	1760 (973-2480)	2920 (1950-4330)	746
Age 12-19 years (2001 - 2002)	267 (231-308)	321 (255-399)	729 (617-856)	1480 (1230-1800)	2180 (1560-3440)	744
Age 12-19 years (2003 - 2004)	314 (267-369)	400 (333-468)	866 (736-1050)	1690 (1410-2080)	2620 (2000-2890)	729
Age 12-19 years (2005 - 2006)	292 (245-348)	393 (350-492)	877 (681-1010)	1620 (1470-1800)	2360 (1780-2960)	693
Age 12-19 years (2007 - 2008)	250 (203-309)	281 (217-444)	832 (645-1000)	1450 (1100-2030)	2390 (1450-3320)	375
Age 12-19 years (2009 - 2010)	194 (154-244)	229 (181-318)	632 (479-735)	1340 (812-2040)	2190 (1340-2960)	447
Age 20+ years (1999 - 2000)	230 (193-274)	310 (242-375)	734 (599-888)	2000 (1490-2390)	2790 (2510-3540)	1471
Age 20+ years (2001 - 2002)	254 (223-289)	357 (314-397)	835 (760-914)	1660 (1460-1890)	2840 (1890-3610)	1654
Age 20+ years (2003 - 2004)	286 (253-324)	394 (311-465)	900 (824-960)	1820 (1560-2060)	2630 (2350-3100)	1524
Age 20+ years (2005 - 2006)	280 (238-330)	379 (332-460)	958 (843-1110)	1970 (1760-2310)	3130 (2540-3570)	1484
Age 20+ years (2007 - 2008)	239 (205-280)	311 (258-374)	923 (746-1090)	1800 (1480-2370)	3000 (2210-4030)	1689
Age 20+ years (2009 - 2010)	215 (189-243)	272 (228-320)	768 (666-930)	1850 (1590-2140)	2770 (2350-3690)	1974
Males (1999 - 2000)	254 (212-304)	351 (266-418)	778 (579-1050)	2000 (1580-2400)	2730 (2430-3350)	1219
Males (2001 - 2002)	262 (233-295)	340 (314-387)	873 (769-957)	1810 (1490-2470)	3050 (1990-4070)	1375
Males (2003 - 2004)	314 (280-351)	425 (376-477)	938 (840-1060)	1760 (1540-2050)	2620 (2060-3230)	1244
Males (2005 - 2006)	301 (247-368)	421 (341-515)	1000 (854-1150)	2020 (1730-2330)	3130 (2660-3340)	1252
Males (2007 - 2008)	245 (215-278)	321 (261-389)	882 (714-1030)	1620 (1420-2050)	2700 (2000-3360)	1198
Males (2009 - 2010)	210 (173-256)	254 (207-324)	718 (583-870)	1670 (1300-2110)	2680 (1850-4060)	1377
Females (1999 - 2000)	226 (180-284)	287 (236-339)	684 (560-799)	1890 (1200-2460)	2830 (2100-4330)	1329
Females (2001 - 2002)	255 (226-288)	357 (298-397)	759 (680-840)	1450 (1190-1700)	2200 (1710-2950)	1419
Females (2003 - 2004)	283 (233-343)	371 (278-465)	859 (706-984)	1810 (1440-2170)	2630 (2210-3440)	1350
Females (2005 - 2006)	267 (220-324)	359 (318-445)	874 (716-1030)	1770 (1440-2020)	2660 (2040-3270)	1276
Females (2007 - 2008)	240 (196-293)	301 (234-394)	875 (747-1030)	1870 (1510-2200)	2920 (2160-3510)	1226
Females (2009 - 2010)	220 (196-247)	281 (237-325)	749 (662-868)	1850 (1520-2220)	2690 (2350-3200)	1415

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.6, 1.9, 0.3, 0.1, 0.1, and 0.1 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Enterolactone (1999 – 2010)‡

CAS Number 77756-20-8

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	212 (169-265)	281 (230-335)	631 (539-732)	1650 (950-2210)	2690 (2380-3350)	813
Mexican Americans (2001 - 2002)	275 (221-342)	347 (312-395)	778 (671-913)	1520 (1090-1920)	2340 (1610-2990)	679
Mexican Americans (2003 - 2004)	275 (239-316)	376 (316-435)	849 (744-958)	1560 (1320-1860)	2240 (1860-3100)	653
Mexican Americans (2005 - 2006)	359 (311-415)	420 (364-515)	914 (750-1080)	1710 (1340-2060)	2660 (1950-3180)	634
Mexican Americans (2007 - 2008)	227 (182-283)	320 (240-385)	747 (634-876)	1520 (1300-1740)	2070 (1650-2840)	520
Mexican Americans (2009 - 2010)	198 (166-237)	265 (215-303)	642 (524-752)	1290 (981-1640)	1930 (1380-2280)	604
Non-Hispanic blacks (1999 - 2000)	262 (196-349)	363 (293-440)	759 (629-925)	1730 (1000-2420)	2500 (1870-3280)	605
Non-Hispanic blacks (2001 - 2002)	278 (226-342)	418 (341-479)	769 (686-853)	1450 (1160-1840)	2000 (1540-2420)	706
Non-Hispanic blacks (2003 - 2004)	328 (285-378)	437 (362-526)	942 (768-1110)	1580 (1360-1820)	2280 (1880-2640)	699
Non-Hispanic blacks (2005 - 2006)	276 (237-322)	411 (346-483)	924 (827-1050)	1660 (1430-2040)	2620 (2220-3080)	662
Non-Hispanic blacks (2007 - 2008)	252 (185-343)	362 (272-452)	902 (700-1120)	1820 (1320-2100)	2350 (1920-3160)	562
Non-Hispanic blacks (2009 - 2010)	187 (140-250)	267 (180-346)	777 (543-945)	1410 (1150-1810)	1920 (1580-2340)	534
Non-Hispanic whites (1999 - 2000)	247 (196-311)	317 (240-403)	752 (616-955)	2040 (1600-2450)	3000 (2460-3880)	917
Non-Hispanic whites (2001 - 2002)	267 (235-303)	357 (307-397)	834 (750-923)	1630 (1420-1890)	2780 (1820-3740)	1222
Non-Hispanic whites (2003 - 2004)	299 (254-352)	396 (299-488)	900 (789-996)	1810 (1510-2140)	2680 (2310-3230)	1079
Non-Hispanic whites (2005 - 2006)	274 (228-329)	373 (318-460)	923 (745-1080)	1800 (1610-2020)	2910 (2360-3220)	1039
Non-Hispanic whites (2007 - 2008)	265 (218-322)	328 (266-409)	926 (733-1130)	1790 (1420-2580)	3030 (2050-4310)	993
Non-Hispanic whites (2009 - 2010)	236 (210-265)	293 (244-334)	765 (660-899)	1900 (1590-2310)	2990 (2210-4300)	1186

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.6, 1.9, 0.3, 0.1, 0.1, and 0.1 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Enterolactone (creatinine corrected) (1999 – 2010)‡

CAS Number 77756-20-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	218 (184-260)	284 (247-336)	733 (613-869)	1580 (1290-1830)	2250 (1860-2830)	2548
Total population (2001 - 2002)	243 (220-268)	324 (293-360)	756 (668-858)	1430 (1250-1580)	2120 (1720-2450)	2794
Total population (2003 - 2004)	279 (245-317)	371 (324-430)	810 (697-911)	1590 (1350-1910)	2400 (2000-2890)	2594
Total population (2005 - 2006)	276 (237-321)	382 (329-448)	856 (775-975)	1640 (1480-1840)	2650 (2240-3380)	2528
Total population (2007 - 2008)	243 (211-281)	345 (292-402)	826 (733-946)	1650 (1390-2050)	2730 (2080-3510)	2424
Total population (2009 - 2010)	230 (206-258)	301 (268-342)	779 (695-882)	1800 (1540-2090)	2820 (2400-3420)	2791
Age 6-11 years (1999 - 2000)	315 (238-416)	384 (266-435)	704 (495-1110)	1580 (1110-2010)	2100 (1580-3040)	331
Age 6-11 years (2001 - 2002)	327 (274-391)	349 (263-478)	738 (603-994)	1420 (1140-1800)	2020 (1420-2940)	396
Age 6-11 years (2003 - 2004)	409 (310-540)	470 (354-632)	904 (669-1150)	1480 (1090-2420)	2300 (1480-2690)	341
Age 6-11 years (2005 - 2006)	331 (268-408)	459 (325-528)	778 (637-1010)	1480 (1130-1750)	1820 (1430-2510)	351
Age 6-11 years (2007 - 2008)	313 (255-384)	402 (309-484)	766 (725-824)	1310 (1020-1590)	1650 (1310-2220)	360
Age 6-11 years (2009 - 2010)	346 (283-424)	416 (323-471)	753 (607-904)	1440 (1100-2000)	2290 (1440-3340)	370
Age 12-19 years (1999 - 2000)	169 (133-214)	210 (172-264)	486 (371-615)	1150 (742-1540)	1850 (1310-2350)	746
Age 12-19 years (2001 - 2002)	206 (178-239)	255 (223-293)	619 (466-753)	1110 (869-1480)	1500 (1140-2080)	744
Age 12-19 years (2003 - 2004)	235 (202-273)	285 (255-307)	631 (533-744)	1230 (993-1350)	1510 (1240-2230)	729
Age 12-19 years (2005 - 2006)	216 (184-254)	297 (255-336)	627 (514-701)	1010 (853-1170)	1410 (1150-1700)	693
Age 12-19 years (2007 - 2008)	192 (149-248)	273 (197-373)	540 (477-676)	936 (708-1220)	1620 (936-3420)	375
Age 12-19 years (2009 - 2010)	182 (147-226)	228 (176-295)	514 (362-809)	1140 (817-1530)	1740 (1140-3160)	447
Age 20+ years (1999 - 2000)	217 (181-261)	288 (249-350)	785 (653-923)	1640 (1330-1890)	2310 (1890-3110)	1471
Age 20+ years (2001 - 2002)	240 (213-271)	331 (300-375)	786 (672-915)	1460 (1300-1630)	2180 (1890-2470)	1654
Age 20+ years (2003 - 2004)	274 (236-318)	377 (316-448)	823 (697-937)	1700 (1430-1980)	2480 (2040-3100)	1524
Age 20+ years (2005 - 2006)	281 (236-335)	399 (326-491)	942 (831-1040)	1730 (1570-2200)	2930 (2350-3530)	1484
Age 20+ years (2007 - 2008)	246 (210-287)	350 (291-418)	906 (784-1040)	1810 (1420-2360)	2820 (2320-3570)	1689
Age 20+ years (2009 - 2010)	229 (203-257)	300 (271-346)	828 (727-939)	1920 (1640-2350)	3070 (2530-3760)	1974
Males (1999 - 2000)	199 (170-234)	263 (228-309)	664 (490-828)	1380 (1200-1710)	2030 (1780-2480)	1219
Males (2001 - 2002)	213 (191-238)	287 (255-316)	682 (601-764)	1350 (1090-1580)	1980 (1570-2550)	1375
Males (2003 - 2004)	245 (215-280)	330 (288-372)	729 (676-808)	1330 (1160-1580)	2040 (1590-2380)	1244
Males (2005 - 2006)	243 (196-300)	336 (279-418)	800 (707-897)	1500 (1270-1680)	2200 (1890-2480)	1252
Males (2007 - 2008)	206 (176-241)	303 (251-358)	715 (594-859)	1410 (1080-1850)	2140 (1560-3060)	1198
Males (2009 - 2010)	192 (157-235)	261 (210-310)	650 (543-766)	1440 (1170-1670)	2300 (1540-3220)	1376
Females (1999 - 2000)	238 (191-297)	303 (260-379)	819 (662-968)	1720 (1390-2010)	2550 (1940-3390)	1329
Females (2001 - 2002)	274 (241-312)	356 (313-407)	833 (710-1000)	1490 (1320-1670)	2150 (1890-2410)	1419
Females (2003 - 2004)	314 (257-385)	414 (327-510)	866 (704-1090)	1840 (1460-2280)	2840 (2220-3910)	1350
Females (2005 - 2006)	313 (261-375)	419 (337-529)	954 (809-1060)	1840 (1550-2320)	3100 (2350-4580)	1276
Females (2007 - 2008)	285 (234-346)	396 (327-469)	966 (843-1060)	1910 (1560-2410)	3040 (2730-3740)	1226
Females (2009 - 2010)	274 (244-309)	362 (305-416)	907 (789-1100)	2200 (1730-2810)	3570 (2800-4200)	1415

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Enterolactone (creatinine corrected) (1999 – 2010)‡

CAS Number 77756-20-8

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	194 (165-228)	254 (225-282)	605 (519-695)	1340 (969-1740)	2100 (1620-2790)	813
Mexican Americans (2001 - 2002)	259 (213-314)	362 (296-409)	730 (586-905)	1240 (1010-1490)	1630 (1240-2540)	679
Mexican Americans (2003 - 2004)	248 (217-282)	350 (310-403)	724 (657-826)	1320 (1020-1560)	1820 (1460-2170)	653
Mexican Americans (2005 - 2006)	324 (267-393)	379 (315-471)	773 (679-953)	1560 (1290-1680)	2060 (1630-2560)	634
Mexican Americans (2007 - 2008)	223 (185-268)	312 (267-379)	733 (642-871)	1330 (1110-1580)	1860 (1620-2160)	520
Mexican Americans (2009 - 2010)	208 (174-249)	284 (214-322)	624 (505-728)	1270 (1090-1460)	1870 (1460-2130)	604
Non-Hispanic blacks (1999 - 2000)	168 (125-226)	214 (173-274)	546 (411-732)	1130 (874-1450)	1590 (1120-2560)	605
Non-Hispanic blacks (2001 - 2002)	195 (155-245)	302 (257-331)	562 (470-629)	985 (821-1130)	1490 (1080-1730)	706
Non-Hispanic blacks (2003 - 2004)	233 (197-274)	303 (276-347)	621 (512-707)	1050 (917-1350)	1550 (1170-2220)	699
Non-Hispanic blacks (2005 - 2006)	193 (167-223)	286 (252-331)	630 (556-729)	1120 (967-1230)	1490 (1220-1650)	662
Non-Hispanic blacks (2007 - 2008)	195 (144-264)	291 (191-408)	659 (564-741)	1220 (993-1360)	1480 (1350-2060)	562
Non-Hispanic blacks (2009 - 2010)	150 (113-200)	256 (183-328)	539 (457-659)	927 (757-1160)	1310 (1000-1720)	533
Non-Hispanic whites (1999 - 2000)	241 (194-300)	323 (279-388)	828 (674-997)	1780 (1390-2020)	2490 (1930-3340)	917
Non-Hispanic whites (2001 - 2002)	264 (232-301)	339 (299-393)	833 (719-944)	1530 (1340-1880)	2410 (1940-2800)	1222
Non-Hispanic whites (2003 - 2004)	294 (246-353)	399 (326-488)	836 (707-980)	1660 (1330-2040)	2500 (1990-3350)	1079
Non-Hispanic whites (2005 - 2006)	288 (238-347)	403 (326-500)	926 (809-1050)	1700 (1500-2200)	2930 (2230-3710)	1039
Non-Hispanic whites (2007 - 2008)	276 (225-337)	386 (318-467)	911 (736-1100)	1870 (1370-2730)	2850 (2200-3640)	993
Non-Hispanic whites (2009 - 2010)	264 (233-299)	329 (290-385)	895 (779-1030)	2140 (1640-2780)	3420 (2740-3990)	1186

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Equol (1999 – 2010)‡

CAS Number 531-95-3

Metabolite of Daidzein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	8.37 (7.21-9.72)	8.02 (6.27-9.90)	17.2 (15.2-19.8)	35.0 (28.9-41.6)	53.7 (40.1-74.2)	2182
Total population (2001 - 2002)	9.17 (7.76-10.8)	9.00 (7.40-10.5)	19.6 (16.6-23.5)	42.1 (34.3-51.5)	73.5 (53.6-89.2)	2794
Total population (2003 - 2004)	8.02 (7.07-9.10)	8.00 (6.80-9.40)	18.2 (15.2-20.8)	36.6 (31.3-40.0)	64.9 (45.4-97.9)	2590
Total population (2005 - 2006)	8.40 (7.63-9.24)	8.61 (7.89-9.17)	18.1 (16.4-20.4)	37.6 (33.9-41.8)	64.5 (54.8-85.3)	2527
Total population (2007 - 2008)	7.29 (6.21-8.57)	7.18 (6.18-8.44)	15.3 (12.5-18.5)	30.7 (24.5-43.2)	65.9 (50.7-131)	2424
Total population (2009 - 2010)	7.82 (6.91-8.85)	7.39 (6.59-8.34)	17.1 (14.9-18.9)	38.0 (33.9-42.4)	68.6 (52.4-95.6)	2792
Age 6-11 years (1999 - 2000)	10.5 (7.65-14.3)	11.7 (5.43-18.6)	24.9 (17.5-29.5)	34.4 (29.5-53.3)	56.1 (30.1-149)	272
Age 6-11 years (2001 - 2002)	12.2 (10.2-14.6)	13.7 (11.1-16.2)	26.2 (17.9-37.9)	50.4 (35.0-84.3)	85.4 (50.4-159)	396
Age 6-11 years (2003 - 2004)	12.4 (9.71-15.8)	12.1 (8.40-17.8)	24.4 (20.1-31.2)	46.7 (33.5-82.3)	85.8 (44.9-118)	341
Age 6-11 years (2005 - 2006)	13.3 (11.3-15.7)	13.5 (12.1-16.8)	26.5 (20.8-34.1)	45.6 (39.3-69.6)	70.3 (44.7-144)	351
Age 6-11 years (2007 - 2008)	10.9 (8.38-14.3)	11.3 (8.60-13.2)	22.0 (15.8-27.5)	55.9 (24.2-77.8)	73.3 (59.5-115)	360
Age 6-11 years (2009 - 2010)	13.4 (9.85-18.4)	12.7 (9.01-16.7)	28.5 (22.6-41.8)	68.0 (45.3-179)	242 (68.0-598)	371
Age 12-19 years (1999 - 2000)	10.9 (8.64-13.8)	10.8 (8.52-13.4)	22.3 (16.0-34.9)	42.9 (34.1-71.3)	71.6 (48.1-210)	657
Age 12-19 years (2001 - 2002)	10.2 (8.50-12.1)	10.5 (8.20-12.5)	20.5 (16.8-24.8)	43.1 (30.1-56.1)	70.0 (46.3-99.2)	744
Age 12-19 years (2003 - 2004)	10.6 (8.97-12.4)	10.5 (8.70-12.2)	22.6 (19.3-26.4)	39.9 (34.8-45.1)	61.9 (45.1-113)	729
Age 12-19 years (2005 - 2006)	11.6 (10.3-13.0)	11.4 (9.25-12.3)	23.2 (20.3-28.8)	46.3 (37.2-64.0)	81.8 (50.1-146)	693
Age 12-19 years (2007 - 2008)	8.47 (7.19-9.98)	7.91 (6.79-9.30)	16.0 (12.8-19.0)	32.7 (24.5-43.2)	65.6 (33.6-148)	375
Age 12-19 years (2009 - 2010)	11.4 (8.90-14.6)	9.60 (7.57-14.1)	24.6 (19.6-29.6)	48.0 (35.9-112)	220 (69.4-701)	447
Age 20+ years (1999 - 2000)	7.79 (6.79-8.94)	7.43 (5.71-8.85)	16.0 (13.6-18.1)	33.1 (24.4-39.7)	52.2 (36.3-93.9)	1253
Age 20+ years (2001 - 2002)	8.70 (7.29-10.4)	8.00 (6.20-10.2)	18.6 (15.0-22.3)	41.3 (34.1-47.4)	73.5 (53.9-89.0)	1654
Age 20+ years (2003 - 2004)	7.28 (6.37-8.33)	7.20 (6.00-8.70)	16.0 (14.2-19.2)	33.9 (28.2-38.9)	63.0 (41.3-121)	1520
Age 20+ years (2005 - 2006)	7.58 (6.82-8.42)	7.57 (7.01-8.30)	16.6 (14.9-18.2)	33.6 (29.1-42.6)	58.1 (50.6-89.0)	1483
Age 20+ years (2007 - 2008)	6.82 (5.70-8.17)	6.75 (5.70-7.98)	14.3 (11.6-18.3)	28.9 (23.6-41.9)	65.8 (47.7-135)	1689
Age 20+ years (2009 - 2010)	6.97 (6.07-8.00)	6.72 (5.78-7.75)	15.0 (13.1-17.1)	33.2 (28.4-38.3)	57.7 (44.6-75.4)	1974
Males (1999 - 2000)	9.15 (7.37-11.4)	8.44 (6.36-11.2)	19.0 (15.9-24.0)	35.6 (29.2-54.8)	71.3 (39.7-166)	1042
Males (2001 - 2002)	9.41 (7.99-11.1)	9.20 (7.70-10.8)	20.1 (16.7-26.1)	43.1 (32.4-53.1)	61.7 (51.8-81.5)	1375
Males (2003 - 2004)	8.56 (7.54-9.72)	8.70 (7.20-10.2)	19.0 (15.9-21.6)	38.0 (31.9-44.2)	72.6 (45.4-100)	1240
Males (2005 - 2006)	9.13 (7.99-10.4)	9.42 (8.16-10.8)	20.0 (16.7-23.8)	39.4 (33.8-45.3)	63.1 (52.0-88.1)	1252
Males (2007 - 2008)	7.58 (6.40-8.97)	7.74 (6.62-8.80)	15.5 (12.5-18.2)	32.7 (24.5-41.9)	65.6 (47.7-133)	1198
Males (2009 - 2010)	8.20 (7.14-9.42)	8.18 (6.86-9.67)	18.4 (15.2-21.3)	39.3 (31.4-48.0)	70.7 (53.4-112)	1377
Females (1999 - 2000)	7.70 (6.79-8.75)	7.57 (5.79-9.04)	15.6 (12.7-18.9)	33.6 (26.7-37.7)	48.2 (37.1-62.9)	1140
Females (2001 - 2002)	8.94 (7.38-10.8)	8.60 (6.70-10.7)	19.0 (15.6-22.9)	41.6 (33.3-51.5)	79.8 (56.6-122)	1419
Females (2003 - 2004)	7.55 (6.44-8.84)	7.30 (6.20-9.00)	16.9 (14.7-19.8)	33.8 (28.3-40.0)	60.3 (42.5-116)	1350
Females (2005 - 2006)	7.75 (6.85-8.78)	7.57 (6.87-8.37)	16.7 (15.0-18.0)	35.6 (30.9-43.1)	69.2 (51.7-125)	1275
Females (2007 - 2008)	7.03 (5.84-8.47)	6.75 (5.85-7.85)	15.1 (12.3-19.0)	30.0 (24.4-48.3)	76.3 (49.5-163)	1226
Females (2009 - 2010)	7.47 (6.33-8.81)	6.75 (5.70-7.85)	15.4 (13.1-18.5)	36.4 (29.4-45.3)	65.2 (46.4-130)	1415

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 3.0, 3.3, 0.3, 0.06, 0.06, and 0.06 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Equol (1999 – 2010)‡

CAS Number 531-95-3

Metabolite of Daidzein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	5.24 (4.77-5.76)	4.51 (3.65-5.18)	9.48 (7.96-10.3)	18.5 (14.5-22.6)	30.9 (21.6-48.4)	726
Mexican Americans (2001 - 2002)	7.22 (6.04-8.62)	6.50 (4.40-9.10)	14.2 (11.3-20.1)	31.4 (21.1-41.0)	42.4 (38.1-60.2)	679
Mexican Americans (2003 - 2004)	6.08 (5.08-7.28)	5.70 (4.70-6.80)	12.5 (9.80-15.4)	26.1 (18.1-39.7)	43.6 (34.3-88.2)	653
Mexican Americans (2005 - 2006)	6.04 (5.31-6.87)	6.13 (5.28-7.35)	13.3 (11.2-14.7)	25.2 (19.6-33.4)	47.6 (33.6-67.1)	634
Mexican Americans (2007 - 2008)	5.52 (5.02-6.07)	5.15 (4.71-5.86)	11.4 (10.1-14.0)	23.2 (20.2-30.3)	39.9 (30.7-60.9)	520
Mexican Americans (2009 - 2010)	5.07 (4.51-5.71)	5.13 (4.45-5.74)	11.1 (8.72-13.0)	20.2 (17.1-29.7)	46.3 (29.7-75.4)	604
Non-Hispanic blacks (1999 - 2000)	6.73 (5.20-8.71)	6.24 (3.86-10.0)	15.1 (12.7-17.6)	27.6 (19.4-35.6)	36.4 (28.9-49.4)	514
Non-Hispanic blacks (2001 - 2002)	7.15 (6.06-8.43)	6.10 (4.70-7.60)	14.7 (12.0-18.7)	30.9 (22.8-41.9)	45.7 (36.1-90.5)	706
Non-Hispanic blacks (2003 - 2004)	7.35 (6.16-8.79)	7.90 (6.00-9.60)	16.5 (14.2-18.3)	32.0 (25.1-37.5)	47.0 (37.8-68.2)	696
Non-Hispanic blacks (2005 - 2006)	6.96 (5.89-8.22)	6.37 (5.44-7.95)	15.1 (11.7-20.2)	30.1 (23.8-39.4)	48.8 (38.7-64.9)	662
Non-Hispanic blacks (2007 - 2008)	6.73 (5.28-8.59)	6.69 (5.17-8.19)	15.2 (11.9-18.5)	31.3 (21.7-50.7)	72.0 (36.1-402)	562
Non-Hispanic blacks (2009 - 2010)	5.59 (4.98-6.27)	5.98 (5.37-6.48)	12.2 (10.8-14.2)	25.0 (21.6-31.0)	43.3 (32.4-53.7)	534
Non-Hispanic whites (1999 - 2000)	9.26 (7.80-11.0)	8.98 (6.73-11.9)	19.0 (16.1-22.8)	36.2 (30.1-45.4)	56.1 (42.1-89.4)	758
Non-Hispanic whites (2001 - 2002)	9.91 (7.95-12.4)	10.0 (7.30-12.6)	22.0 (17.4-27.4)	44.4 (35.1-57.5)	74.4 (55.1-107)	1222
Non-Hispanic whites (2003 - 2004)	8.52 (7.26-10.0)	8.80 (7.10-10.3)	19.3 (15.4-23.0)	37.7 (31.7-44.2)	73.1 (46.7-120)	1078
Non-Hispanic whites (2005 - 2006)	9.05 (8.08-10.1)	9.49 (8.47-10.4)	19.4 (16.6-23.2)	39.2 (33.9-45.1)	69.2 (52.2-130)	1038
Non-Hispanic whites (2007 - 2008)	8.01 (6.45-9.93)	8.19 (6.59-9.49)	16.1 (12.5-21.7)	32.7 (24.1-55.9)	79.5 (47.7-152)	993
Non-Hispanic whites (2009 - 2010)	9.45 (8.04-11.1)	9.15 (7.87-10.2)	19.3 (17.5-22.4)	41.3 (35.4-48.7)	75.4 (52.4-189)	1186

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 3.0, 3.3, 0.3, 0.06, 0.06, and 0.06 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Equol (creatinine corrected) (1999 – 2010)‡

CAS Number 531-95-3

Metabolite of Daidzein

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	7.70 (6.82-8.70)	7.96 (6.87-9.35)	16.2 (13.2-18.6)	30.6 (26.9-35.1)	50.3 (41.8-67.3)	2182
Total population (2001 - 2002)	8.60 (7.26-10.2)	7.98 (6.62-9.76)	17.6 (14.8-21.8)	37.8 (30.3-46.3)	62.6 (50.0-85.0)	2794
Total population (2003 - 2004)	7.52 (6.83-8.29)	7.29 (6.56-8.18)	14.6 (13.3-15.7)	27.8 (24.7-31.9)	50.6 (39.9-75.0)	2590
Total population (2005 - 2006)	8.18 (7.33-9.14)	7.92 (7.01-8.76)	15.9 (14.2-17.4)	32.7 (29.9-35.1)	69.1 (48.4-105)	2527
Total population (2007 - 2008)	7.33 (6.34-8.48)	6.91 (6.13-7.86)	14.4 (12.2-16.7)	28.9 (23.5-37.4)	60.9 (40.5-93.1)	2424
Total population (2009 - 2010)	8.38 (7.52-9.33)	7.70 (6.80-8.69)	16.6 (15.3-18.1)	36.3 (30.5-44.5)	73.4 (54.2-122)	2791
Age 6-11 years (1999 - 2000)	10.3 (7.83-13.5)	11.4 (7.46-16.3)	22.6 (14.7-27.2)	32.7 (25.5-46.0)	47.8 (32.7-150)	272
Age 6-11 years (2001 - 2002)	13.9 (11.2-17.2)	14.0 (10.6-17.0)	28.8 (19.6-39.8)	54.4 (34.9-99.8)	88.2 (56.8-186)	396
Age 6-11 years (2003 - 2004)	13.2 (10.9-15.9)	13.2 (9.19-17.5)	24.2 (20.6-28.0)	41.6 (35.2-64.1)	93.5 (45.4-117)	341
Age 6-11 years (2005 - 2006)	14.7 (12.6-17.1)	15.3 (13.8-17.4)	26.2 (21.2-34.4)	48.0 (40.6-70.3)	88.9 (55.4-267)	351
Age 6-11 years (2007 - 2008)	13.4 (10.8-16.6)	13.1 (10.6-15.2)	22.6 (16.9-32.8)	45.2 (28.8-84.4)	72.8 (45.8-199)	360
Age 6-11 years (2009 - 2010)	18.3 (13.5-24.7)	15.7 (11.5-19.3)	42.0 (28.1-54.1)	84.1 (63.5-183)	232 (98.4-498)	370
Age 12-19 years (1999 - 2000)	7.61 (6.17-9.39)	8.02 (6.72-9.29)	14.0 (11.4-20.4)	27.5 (20.8-38.3)	47.4 (27.5-149)	657
Age 12-19 years (2001 - 2002)	7.83 (6.68-9.17)	7.77 (6.29-9.13)	17.4 (14.9-19.2)	31.9 (25.3-41.7)	54.3 (33.0-76.7)	744
Age 12-19 years (2003 - 2004)	7.91 (6.59-9.49)	8.11 (6.80-9.09)	14.5 (11.8-17.5)	30.1 (21.0-38.2)	40.6 (32.6-66.9)	729
Age 12-19 years (2005 - 2006)	8.61 (7.54-9.83)	8.03 (7.00-9.21)	16.3 (13.4-19.0)	31.8 (25.3-37.6)	62.0 (37.0-129)	693
Age 12-19 years (2007 - 2008)	6.51 (5.69-7.46)	5.83 (4.78-6.71)	12.6 (10.5-16.4)	28.7 (20.8-35.3)	50.4 (30.7-72.7)	375
Age 12-19 years (2009 - 2010)	10.7 (8.50-13.5)	8.95 (7.40-10.3)	20.6 (15.9-23.3)	46.3 (31.3-101)	215 (58.9-919)	447
Age 20+ years (1999 - 2000)	7.45 (6.60-8.41)	7.63 (6.35-9.22)	15.3 (12.7-17.7)	30.8 (25.0-37.2)	53.2 (41.2-71.8)	1253
Age 20+ years (2001 - 2002)	8.23 (6.93-9.79)	7.52 (5.97-9.56)	16.6 (14.0-20.7)	36.4 (29.3-42.9)	58.7 (47.9-85.0)	1654
Age 20+ years (2003 - 2004)	6.98 (6.30-7.73)	6.76 (6.05-7.65)	13.6 (12.5-14.8)	24.6 (21.9-29.4)	42.8 (35.7-81.6)	1520
Age 20+ years (2005 - 2006)	7.60 (6.72-8.59)	7.43 (6.63-8.21)	14.1 (12.4-16.4)	30.1 (23.9-34.9)	65.9 (42.7-123)	1483
Age 20+ years (2007 - 2008)	7.00 (5.90-8.31)	6.64 (5.73-7.57)	13.2 (11.2-16.2)	26.4 (21.6-38.4)	57.7 (38.4-97.0)	1689
Age 20+ years (2009 - 2010)	7.43 (6.61-8.34)	6.97 (6.09-8.08)	15.0 (13.5-16.7)	29.2 (25.3-34.5)	54.7 (41.4-75.7)	1974
Males (1999 - 2000)	7.01 (5.93-8.29)	7.32 (5.63-8.78)	13.8 (11.7-17.6)	29.3 (21.4-41.8)	54.1 (35.8-81.0)	1042
Males (2001 - 2002)	7.66 (6.39-9.18)	7.43 (5.81-9.16)	16.2 (14.0-19.4)	32.9 (27.9-40.4)	54.3 (37.8-67.1)	1375
Males (2003 - 2004)	6.71 (6.02-7.47)	6.63 (5.78-7.29)	13.3 (11.9-15.5)	25.7 (23.1-30.3)	51.1 (37.1-76.7)	1240
Males (2005 - 2006)	7.35 (6.40-8.43)	7.03 (5.90-8.67)	14.9 (12.0-18.3)	31.4 (26.8-34.0)	57.6 (42.7-83.5)	1252
Males (2007 - 2008)	6.39 (5.52-7.41)	6.10 (5.28-6.85)	12.2 (10.6-14.3)	25.7 (20.4-33.0)	48.4 (35.3-77.1)	1198
Males (2009 - 2010)	7.49 (6.54-8.59)	6.90 (5.98-8.20)	15.7 (14.1-17.3)	32.4 (25.3-44.1)	73.4 (44.2-130)	1376
Females (1999 - 2000)	8.41 (7.33-9.66)	8.71 (7.33-10.1)	17.7 (15.1-20.0)	31.6 (27.5-37.2)	46.3 (41.0-56.5)	1140
Females (2001 - 2002)	9.60 (7.99-11.5)	8.66 (6.97-10.6)	19.2 (15.7-23.7)	41.7 (32.3-55.9)	85.0 (61.7-115)	1419
Females (2003 - 2004)	8.38 (7.39-9.51)	8.29 (7.03-9.28)	15.1 (14.0-16.6)	30.6 (25.0-32.5)	45.4 (38.7-102)	1350
Females (2005 - 2006)	9.07 (8.04-10.2)	8.49 (7.90-9.22)	16.7 (15.3-18.1)	34.3 (29.9-40.7)	85.1 (48.4-144)	1275
Females (2007 - 2008)	8.35 (6.98-9.99)	7.97 (6.83-9.31)	16.0 (13.4-20.0)	32.8 (23.7-46.1)	67.5 (41.6-167)	1226
Females (2009 - 2010)	9.34 (7.98-10.9)	8.44 (7.24-9.76)	17.4 (15.1-20.4)	39.6 (30.7-54.2)	72.9 (51.6-158)	1415

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Equol (creatinine corrected) (1999 – 2010)‡

CAS Number 531-95-3

Metabolite of Daidzein

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	4.89 (4.36-5.47)	4.73 (3.90-5.27)	8.85 (8.18-9.91)	22.3 (16.5-26.8)	37.1 (25.3-57.6)	726
Mexican Americans (2001 - 2002)	6.79 (5.82-7.92)	6.81 (5.55-8.04)	14.9 (11.7-17.8)	29.1 (22.9-36.0)	41.3 (31.4-47.1)	679
Mexican Americans (2003 - 2004)	5.48 (4.60-6.54)	4.72 (3.95-5.78)	10.1 (7.76-13.4)	24.4 (17.2-30.9)	35.6 (27.6-102)	653
Mexican Americans (2005 - 2006)	5.45 (4.84-6.14)	5.00 (4.37-5.85)	9.94 (8.80-12.4)	22.3 (19.3-30.0)	39.4 (30.0-61.9)	634
Mexican Americans (2007 - 2008)	5.42 (4.82-6.09)	4.87 (4.28-5.66)	10.9 (9.21-12.2)	20.9 (17.0-26.9)	34.9 (26.9-60.9)	520
Mexican Americans (2009 - 2010)	5.33 (4.60-6.18)	5.00 (4.17-6.16)	9.49 (8.54-11.2)	19.6 (15.1-35.6)	48.5 (30.3-126)	604
Non-Hispanic blacks (1999 - 2000)	4.36 (3.41-5.57)	4.57 (2.94-6.23)	10.2 (7.96-12.0)	17.1 (14.8-19.8)	26.0 (19.6-32.0)	514
Non-Hispanic blacks (2001 - 2002)	5.01 (4.26-5.89)	4.48 (3.80-5.42)	11.0 (8.80-13.0)	22.7 (16.5-29.3)	35.4 (24.8-46.7)	706
Non-Hispanic blacks (2003 - 2004)	5.23 (4.44-6.16)	5.28 (4.67-6.10)	10.3 (8.61-12.3)	20.2 (17.1-23.8)	29.4 (23.9-42.3)	696
Non-Hispanic blacks (2005 - 2006)	4.88 (4.11-5.78)	4.72 (3.55-6.00)	9.40 (7.54-12.0)	21.5 (16.8-24.4)	31.6 (24.4-51.4)	662
Non-Hispanic blacks (2007 - 2008)	5.21 (4.11-6.61)	4.73 (3.77-6.22)	9.81 (7.77-12.7)	19.3 (14.7-28.8)	50.6 (24.2-314)	562
Non-Hispanic blacks (2009 - 2010)	4.50 (4.03-5.01)	4.57 (3.80-5.29)	9.76 (8.00-11.3)	18.4 (15.6-22.3)	26.8 (22.8-29.7)	533
Non-Hispanic whites (1999 - 2000)	9.13 (7.85-10.6)	9.51 (7.63-11.2)	18.0 (15.2-21.6)	35.4 (29.5-41.3)	56.5 (46.0-73.0)	758
Non-Hispanic whites (2001 - 2002)	9.81 (7.93-12.1)	9.17 (7.06-12.2)	19.8 (15.4-25.6)	41.3 (30.7-55.9)	66.4 (56.8-85.0)	1222
Non-Hispanic whites (2003 - 2004)	8.40 (7.50-9.41)	8.17 (7.13-9.19)	15.6 (14.1-17.1)	30.6 (25.0-32.8)	56.8 (38.0-107)	1078
Non-Hispanic whites (2005 - 2006)	9.51 (8.48-10.7)	9.17 (8.06-10.5)	17.1 (15.0-19.4)	34.5 (31.0-40.6)	77.7 (48.4-129)	1038
Non-Hispanic whites (2007 - 2008)	8.33 (6.76-10.3)	7.94 (6.62-9.61)	15.7 (12.5-20.4)	30.7 (23.4-46.1)	65.2 (38.9-144)	993
Non-Hispanic whites (2009 - 2010)	10.6 (9.17-12.2)	9.69 (8.74-10.8)	20.5 (17.8-22.5)	44.2 (33.4-60.8)	84.1 (60.3-187)	1186

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Genistein (1999 – 2010)‡

CAS Number 446-72-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	24.4 (19.7-30.3)	27.0 (22.5-32.8)	93.6 (75.8-118)	284 (244-331)	563 (413-709)	2557
Total population (2001 - 2002)	33.0 (30.1-36.2)	29.0 (26.8-31.8)	92.5 (77.9-109)	306 (240-372)	619 (523-719)	2794
Total population (2003 - 2004)	31.1 (29.0-33.3)	26.2 (23.9-29.7)	87.8 (78.8-102)	286 (239-313)	528 (402-610)	2594
Total population (2005 - 2006)	28.7 (25.8-32.0)	26.0 (20.9-29.7)	81.0 (73.3-92.4)	261 (232-308)	523 (422-591)	2528
Total population (2007 - 2008)	31.3 (27.3-35.8)	25.7 (22.8-28.9)	89.7 (73.4-109)	309 (227-411)	665 (527-999)	2424
Total population (2009 - 2010)	32.5 (29.3-36.2)	28.2 (23.2-33.1)	102 (88.8-120)	356 (295-428)	691 (530-1060)	2792
Age 6-11 years (1999 - 2000)	27.6 (21.1-36.1)	31.9 (18.1-42.6)	104 (67.6-151)	220 (151-315)	376 (272-725)	331
Age 6-11 years (2001 - 2002)	39.2 (33.4-46.0)	31.7 (25.8-39.6)	94.1 (62.3-158)	258 (190-426)	502 (258-830)	396
Age 6-11 years (2003 - 2004)	33.6 (27.8-40.6)	29.3 (23.1-37.8)	79.4 (56.7-111)	193 (146-274)	351 (207-376)	341
Age 6-11 years (2005 - 2006)	38.6 (29.8-49.9)	34.6 (25.3-42.5)	109 (76.6-181)	367 (252-568)	629 (367-2390)	351
Age 6-11 years (2007 - 2008)	43.7 (32.6-58.5)	34.3 (22.1-56.4)	139 (82.5-194)	505 (251-763)	840 (505-2200)	360
Age 6-11 years (2009 - 2010)	46.1 (37.8-56.3)	38.4 (30.7-46.9)	167 (96.9-253)	467 (280-616)	958 (528-1210)	371
Age 12-19 years (1999 - 2000)	43.7 (34.2-55.7)	45.4 (34.3-60.5)	138 (93.7-179)	319 (245-464)	547 (321-777)	754
Age 12-19 years (2001 - 2002)	34.1 (27.2-42.8)	29.0 (26.1-32.9)	90.6 (71.5-113)	278 (216-363)	470 (360-687)	744
Age 12-19 years (2003 - 2004)	34.7 (29.3-41.0)	29.0 (23.4-37.6)	111 (69.3-141)	304 (206-376)	530 (358-671)	729
Age 12-19 years (2005 - 2006)	34.1 (28.8-40.5)	26.9 (20.5-35.6)	90.5 (76.1-115)	307 (209-394)	486 (372-982)	693
Age 12-19 years (2007 - 2008)	35.2 (28.5-43.5)	28.4 (23.7-34.5)	111 (63.7-138)	279 (160-483)	538 (320-954)	375
Age 12-19 years (2009 - 2010)	39.2 (29.5-52.0)	34.4 (23.5-47.1)	141 (77.0-188)	373 (242-520)	620 (445-1160)	447
Age 20+ years (1999 - 2000)	21.9 (17.6-27.2)	24.0 (21.7-28.4)	86.2 (67.5-108)	293 (235-343)	566 (412-744)	1472
Age 20+ years (2001 - 2002)	32.1 (28.8-35.8)	28.8 (25.4-33.4)	93.4 (77.3-110)	312 (235-389)	627 (537-790)	1654
Age 20+ years (2003 - 2004)	30.2 (27.8-32.8)	25.9 (22.3-29.8)	87.8 (77.9-103)	296 (239-321)	557 (412-653)	1524
Age 20+ years (2005 - 2006)	27.0 (23.9-30.6)	25.0 (19.8-28.8)	77.4 (66.7-89.5)	244 (190-308)	518 (413-591)	1484
Age 20+ years (2007 - 2008)	29.6 (25.4-34.5)	24.7 (21.3-28.4)	84.1 (68.0-98.0)	278 (207-422)	671 (512-1150)	1689
Age 20+ years (2009 - 2010)	30.5 (26.7-34.8)	26.3 (20.3-31.7)	97.5 (77.3-115)	327 (281-425)	691 (523-1110)	1974
Males (1999 - 2000)	29.8 (22.2-40.0)	31.9 (26.3-37.2)	108 (79.1-151)	335 (257-440)	709 (437-981)	1222
Males (2001 - 2002)	32.2 (27.9-37.2)	29.5 (25.4-33.7)	91.2 (73.4-103)	239 (190-331)	474 (335-719)	1375
Males (2003 - 2004)	33.7 (29.6-38.4)	27.3 (23.4-33.0)	92.6 (68.6-124)	310 (228-351)	562 (443-653)	1244
Males (2005 - 2006)	32.1 (28.6-36.0)	29.1 (22.7-33.8)	90.2 (77.5-101)	269 (216-340)	494 (394-591)	1252
Males (2007 - 2008)	33.3 (27.7-40.0)	26.2 (22.3-31.2)	98.0 (71.9-119)	316 (220-477)	723 (501-1510)	1198
Males (2009 - 2010)	33.5 (29.3-38.2)	28.8 (23.6-35.5)	89.8 (74.7-114)	351 (286-425)	623 (476-967)	1377
Females (1999 - 2000)	20.3 (17.0-24.2)	23.1 (20.1-26.3)	84.7 (59.6-105)	242 (203-288)	446 (339-619)	1335
Females (2001 - 2002)	33.7 (30.9-36.8)	28.7 (26.0-32.3)	97.0 (79.9-118)	387 (253-500)	666 (598-807)	1419
Females (2003 - 2004)	28.7 (25.5-32.4)	25.0 (22.4-28.4)	85.0 (71.2-106)	256 (218-308)	467 (356-620)	1350
Females (2005 - 2006)	25.9 (22.3-29.9)	22.4 (17.9-27.4)	74.5 (61.0-87.0)	246 (195-329)	526 (398-657)	1276
Females (2007 - 2008)	29.5 (25.1-34.6)	24.6 (22.2-28.4)	83.5 (63.7-109)	296 (194-432)	661 (448-964)	1226
Females (2009 - 2010)	31.7 (27.6-36.4)	27.0 (21.8-32.1)	115 (101-129)	371 (290-489)	826 (523-1530)	1415

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.3, 0.8, 0.3, 1.0, 0.2, and 0.2 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Genistein (1999 – 2010)‡

CAS Number 446-72-0

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	31.1 (25.1-38.5)	30.0 (25.1-37.3)	117 (82.9-179)	328 (248-494)	573 (419-1180)	819
Mexican Americans (2001 - 2002)	28.3 (22.0-36.4)	25.6 (19.6-32.5)	74.8 (48.8-111)	225 (174-314)	424 (323-523)	679
Mexican Americans (2003 - 2004)	31.1 (27.5-35.2)	25.2 (19.1-32.6)	83.2 (63.6-120)	319 (252-537)	653 (537-851)	653
Mexican Americans (2005 - 2006)	27.6 (24.4-31.2)	26.6 (21.5-30.2)	77.0 (63.3-87.3)	255 (187-319)	412 (320-568)	634
Mexican Americans (2007 - 2008)	30.5 (24.3-38.4)	24.0 (18.9-30.2)	86.8 (68.0-123)	318 (210-414)	603 (414-1130)	520
Mexican Americans (2009 - 2010)	28.7 (23.7-34.7)	24.2 (18.4-32.3)	84.8 (57.8-120)	257 (197-327)	484 (334-623)	604
Non-Hispanic blacks (1999 - 2000)	26.7 (19.2-37.0)	32.9 (24.4-41.5)	103 (84.8-137)	257 (213-367)	495 (329-926)	608
Non-Hispanic blacks (2001 - 2002)	37.6 (27.4-51.6)	35.3 (23.6-49.5)	95.5 (71.1-142)	378 (192-530)	598 (375-1120)	706
Non-Hispanic blacks (2003 - 2004)	32.3 (24.0-43.4)	27.4 (18.8-44.9)	84.8 (60.5-113)	279 (163-412)	514 (323-852)	699
Non-Hispanic blacks (2005 - 2006)	31.0 (26.7-36.1)	27.9 (23.0-34.9)	92.3 (69.3-106)	265 (187-355)	458 (371-643)	662
Non-Hispanic blacks (2007 - 2008)	36.2 (29.3-44.7)	27.3 (22.6-36.8)	124 (84.3-157)	395 (310-530)	912 (567-1490)	562
Non-Hispanic blacks (2009 - 2010)	33.5 (29.0-38.6)	27.8 (23.2-36.4)	99.6 (79.3-120)	321 (218-392)	625 (410-1010)	534
Non-Hispanic whites (1999 - 2000)	23.6 (19.1-29.3)	25.6 (21.7-32.0)	91.4 (68.0-122)	288 (227-353)	566 (395-734)	917
Non-Hispanic whites (2001 - 2002)	30.9 (27.8-34.4)	27.6 (24.6-30.8)	89.7 (71.1-105)	278 (226-365)	626 (485-755)	1222
Non-Hispanic whites (2003 - 2004)	30.8 (28.2-33.6)	26.2 (22.6-31.0)	93.6 (78.8-112)	279 (225-313)	504 (376-610)	1079
Non-Hispanic whites (2005 - 2006)	26.9 (23.6-30.6)	23.8 (19.0-29.1)	77.2 (66.2-87.9)	244 (198-316)	518 (391-609)	1039
Non-Hispanic whites (2007 - 2008)	29.3 (25.2-34.0)	25.2 (22.1-28.5)	84.1 (65.8-102)	235 (182-346)	620 (446-840)	993
Non-Hispanic whites (2009 - 2010)	31.9 (27.4-37.2)	28.3 (21.3-34.6)	102 (75.4-125)	334 (280-450)	691 (501-1060)	1186

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.3, 0.8, 0.3, 1.0, 0.2, and 0.2 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Genistein (creatinine corrected) (1999 – 2010)†

CAS Number 446-72-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	22.3 (17.7-28.1)	23.8 (18.8-28.9)	84.7 (67.2-105)	222 (182-279)	381 (334-497)	2557
Total population (2001 - 2002)	30.9 (28.5-33.6)	25.9 (23.4-29.2)	83.3 (72.2-96.3)	256 (211-296)	427 (375-490)	2794
Total population (2003 - 2004)	29.1 (27.3-31.0)	24.5 (21.3-27.4)	77.7 (67.3-90.9)	231 (203-279)	510 (388-619)	2594
Total population (2005 - 2006)	28.0 (25.3-31.0)	23.2 (20.3-26.4)	72.0 (63.1-85.2)	242 (197-280)	577 (406-734)	2528
Total population (2007 - 2008)	31.4 (27.3-36.1)	23.7 (21.0-27.7)	85.2 (70.3-99.5)	264 (214-375)	751 (464-1130)	2424
Total population (2009 - 2010)	34.9 (31.6-38.4)	25.4 (22.8-30.0)	100 (83.3-124)	367 (313-424)	863 (612-1090)	2791
Age 6-11 years (1999 - 2000)	28.3 (21.1-37.9)	27.8 (15.8-41.3)	94.3 (60.5-145)	209 (148-317)	490 (279-895)	331
Age 6-11 years (2001 - 2002)	44.5 (37.0-53.5)	37.9 (29.7-49.0)	112 (76.5-146)	252 (173-371)	504 (252-713)	396
Age 6-11 years (2003 - 2004)	35.8 (29.7-43.0)	35.4 (24.9-43.2)	78.6 (60.9-119)	172 (130-243)	297 (168-618)	341
Age 6-11 years (2005 - 2006)	42.5 (33.1-54.6)	34.1 (23.7-41.9)	138 (89.5-195)	414 (256-850)	1040 (429-1590)	351
Age 6-11 years (2007 - 2008)	53.5 (41.5-69.0)	44.2 (33.0-63.9)	149 (83.2-224)	451 (236-937)	940 (411-1800)	360
Age 6-11 years (2009 - 2010)	62.8 (52.5-75.1)	47.8 (36.7-63.0)	200 (144-249)	493 (405-644)	875 (551-1140)	370
Age 12-19 years (1999 - 2000)	29.4 (22.3-38.8)	32.0 (23.8-41.6)	83.2 (64.1-104)	184 (130-295)	336 (184-816)	754
Age 12-19 years (2001 - 2002)	26.3 (21.3-32.5)	21.0 (17.8-26.5)	66.2 (47.9-91.5)	200 (149-298)	321 (261-435)	744
Age 12-19 years (2003 - 2004)	25.9 (21.8-30.9)	21.8 (17.0-29.1)	65.6 (51.0-83.1)	201 (145-313)	366 (297-455)	729
Age 12-19 years (2005 - 2006)	25.3 (22.1-29.0)	19.6 (16.4-24.0)	76.5 (51.4-91.6)	164 (130-249)	368 (213-520)	693
Age 12-19 years (2007 - 2008)	27.1 (23.1-31.7)	23.7 (17.8-29.3)	77.7 (56.2-95.3)	159 (125-264)	324 (214-568)	375
Age 12-19 years (2009 - 2010)	36.8 (28.5-47.7)	27.6 (20.4-40.1)	102 (67.5-174)	371 (234-455)	848 (424-1100)	447
Age 20+ years (1999 - 2000)	20.6 (16.3-26.2)	21.6 (17.7-26.2)	83.1 (64.9-107)	234 (190-287)	381 (325-562)	1472
Age 20+ years (2001 - 2002)	30.4 (27.6-33.4)	24.8 (21.9-30.0)	83.1 (68.5-99.0)	269 (208-328)	435 (374-518)	1654
Age 20+ years (2003 - 2004)	28.9 (26.7-31.3)	24.0 (20.1-27.4)	78.5 (66.1-92.9)	253 (209-302)	542 (399-673)	1524
Age 20+ years (2005 - 2006)	27.1 (24.3-30.3)	23.0 (19.7-26.8)	70.3 (61.2-81.3)	233 (184-275)	575 (349-762)	1484
Age 20+ years (2007 - 2008)	30.4 (25.8-35.8)	22.8 (19.9-25.9)	81.2 (63.2-99.5)	263 (205-423)	842 (464-1310)	1689
Age 20+ years (2009 - 2010)	32.5 (28.9-36.5)	23.1 (20.5-28.2)	91.9 (72.8-116)	340 (295-409)	863 (590-1150)	1974
Males (1999 - 2000)	23.3 (16.8-32.3)	23.8 (17.5-32.2)	86.2 (64.7-115)	236 (178-330)	523 (323-889)	1222
Males (2001 - 2002)	26.2 (23.1-29.8)	22.0 (19.4-26.0)	67.6 (57.4-78.1)	186 (144-237)	350 (278-418)	1375
Males (2003 - 2004)	26.4 (22.8-30.5)	21.5 (17.3-26.2)	70.0 (51.1-90.5)	203 (159-235)	415 (346-600)	1244
Males (2005 - 2006)	25.8 (23.4-28.4)	22.8 (19.3-26.4)	65.0 (54.6-82.2)	207 (154-261)	431 (305-628)	1252
Males (2007 - 2008)	28.1 (23.4-33.7)	20.9 (17.6-24.8)	76.1 (58.9-92.9)	249 (174-369)	634 (370-1130)	1198
Males (2009 - 2010)	30.6 (27.3-34.3)	23.5 (20.7-27.5)	78.7 (63.0-101)	313 (241-370)	631 (453-1020)	1376
Females (1999 - 2000)	21.3 (17.5-26.0)	23.2 (17.5-29.3)	83.1 (57.2-106)	211 (154-283)	357 (283-398)	1335
Females (2001 - 2002)	36.2 (32.8-39.9)	29.6 (25.2-34.3)	107 (88.4-129)	321 (269-355)	547 (427-729)	1419
Females (2003 - 2004)	31.9 (28.7-35.5)	27.1 (23.6-31.6)	87.1 (71.1-102)	278 (209-324)	548 (363-763)	1350
Females (2005 - 2006)	30.3 (25.8-35.5)	23.5 (19.8-29.1)	81.3 (67.4-104)	271 (208-406)	658 (444-894)	1276
Females (2007 - 2008)	35.0 (30.1-40.8)	27.7 (23.0-34.7)	95.6 (80.3-107)	290 (220-506)	842 (506-1350)	1226
Females (2009 - 2010)	39.6 (35.2-44.5)	29.4 (23.9-35.5)	131 (101-151)	430 (340-542)	944 (670-1540)	1415

†Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary Genistein (creatinine corrected) (1999 – 2010)†

CAS Number 446-72-0

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	28.4 (23.3-34.7)	27.9 (22.5-35.0)	109 (91.5-137)	257 (209-380)	562 (257-981)	819
Mexican Americans (2001 - 2002)	26.6 (21.6-32.9)	21.0 (16.1-28.9)	61.6 (50.6-76.8)	205 (147-270)	372 (271-479)	679
Mexican Americans (2003 - 2004)	28.0 (24.8-31.8)	23.5 (18.5-28.1)	69.2 (52.3-92.8)	254 (187-390)	608 (417-764)	653
Mexican Americans (2005 - 2006)	24.9 (22.1-28.0)	21.7 (17.8-23.8)	72.4 (56.2-90.2)	202 (140-274)	338 (275-648)	634
Mexican Americans (2007 - 2008)	30.0 (23.2-38.8)	22.5 (16.5-30.5)	88.3 (55.4-127)	287 (210-373)	583 (385-921)	520
Mexican Americans (2009 - 2010)	30.1 (25.4-35.7)	23.2 (19.0-30.5)	79.2 (60.6-108)	262 (192-353)	601 (371-818)	604
Non-Hispanic blacks (1999 - 2000)	17.1 (12.4-23.7)	19.5 (15.7-26.1)	59.5 (43.1-93.7)	179 (132-245)	299 (222-446)	608
Non-Hispanic blacks (2001 - 2002)	26.4 (19.3-36.1)	22.7 (16.4-33.6)	69.4 (42.2-115)	217 (139-317)	384 (217-747)	706
Non-Hispanic blacks (2003 - 2004)	22.8 (18.1-28.8)	19.6 (14.3-27.1)	55.0 (39.6-78.1)	182 (107-240)	311 (210-514)	699
Non-Hispanic blacks (2005 - 2006)	21.7 (18.8-25.1)	18.6 (14.9-21.6)	55.3 (42.6-78.7)	157 (124-235)	351 (235-543)	662
Non-Hispanic blacks (2007 - 2008)	28.0 (22.5-34.9)	20.8 (15.9-25.9)	91.2 (63.7-112)	252 (184-413)	668 (310-1530)	562
Non-Hispanic blacks (2009 - 2010)	26.9 (23.7-30.6)	19.5 (17.6-23.1)	78.0 (58.1-107)	245 (158-341)	505 (341-879)	533
Non-Hispanic whites (1999 - 2000)	23.2 (18.5-29.0)	24.9 (19.0-31.7)	86.1 (68.4-105)	232 (178-295)	381 (325-523)	917
Non-Hispanic whites (2001 - 2002)	30.6 (28.2-33.2)	25.4 (22.7-29.5)	82.0 (68.3-96.3)	248 (207-320)	427 (365-518)	1222
Non-Hispanic whites (2003 - 2004)	30.4 (27.9-33.0)	26.2 (21.5-31.4)	79.6 (69.1-99.6)	238 (195-321)	534 (352-688)	1079
Non-Hispanic whites (2005 - 2006)	28.2 (25.1-31.8)	23.5 (19.8-29.0)	71.7 (58.9-89.6)	242 (192-305)	615 (423-802)	1039
Non-Hispanic whites (2007 - 2008)	30.5 (25.8-36.0)	23.7 (20.2-28.3)	80.1 (63.4-96.6)	256 (185-369)	651 (412-1010)	993
Non-Hispanic whites (2009 - 2010)	35.8 (31.2-41.0)	25.6 (22.5-32.7)	107 (78.5-140)	398 (304-448)	881 (576-1300)	1186

†Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary O-Desmethylangolensin (1999 – 2010)‡

CAS Number 21255-69-6

Metabolite of Daidzein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	4.39 (3.37-5.73)	4.98 (3.65-6.77)	22.7 (18.7-30.1)	100 (74.8-141)	222 (182-250)	2271
Total population (2001 - 2002)	4.08 (3.53-4.73)	3.30 (2.70-4.20)	19.8 (16.7-24.6)	96.0 (70.1-135)	260 (161-437)	2794
Total population (2003 - 2004)	4.91 (4.34-5.55)	4.60 (4.00-5.20)	23.6 (18.6-27.2)	95.9 (70.7-122)	230 (185-342)	2581
Total population (2005 - 2006)	4.71 (4.17-5.31)	3.80 (3.10-4.30)	22.5 (19.7-26.6)	101 (86.4-124)	266 (200-385)	2528
Total population (2007 - 2008)	4.65 (4.02-5.39)	3.40 (2.90-4.20)	23.0 (17.9-29.8)	132 (98.2-181)	328 (236-501)	2424
Total population (2009 - 2010)	4.73 (4.08-5.48)	3.60 (2.90-4.30)	21.8 (16.8-28.4)	125 (99.2-156)	394 (237-615)	2792
Age 6-11 years (1999 - 2000)	5.60 (3.85-8.15)	7.52 (3.43-15.2)	36.2 (20.3-45.0)	78.7 (43.4-191)	176 (74.8-264)	287
Age 6-11 years (2001 - 2002)	6.19 (4.51-8.49)	5.90 (3.80-9.30)	26.9 (15.7-52.1)	122 (61.5-215)	281 (161-466)	396
Age 6-11 years (2003 - 2004)	6.33 (4.30-9.30)	6.10 (3.50-10.6)	24.0 (17.0-33.8)	70.8 (51.4-122)	138 (80.9-256)	341
Age 6-11 years (2005 - 2006)	7.20 (5.20-9.96)	6.20 (4.00-11.0)	37.8 (24.2-55.2)	145 (83.9-295)	386 (201-516)	351
Age 6-11 years (2007 - 2008)	7.50 (5.43-10.4)	5.40 (3.90-9.70)	34.5 (16.5-52.6)	133 (79.9-275)	490 (133-3020)	360
Age 6-11 years (2009 - 2010)	7.85 (6.20-9.94)	7.00 (4.30-11.7)	34.9 (27.7-49.6)	153 (89.1-199)	263 (167-467)	371
Age 12-19 years (1999 - 2000)	6.04 (3.76-9.70)	7.60 (5.13-13.5)	36.6 (22.0-57.3)	107 (63.4-165)	194 (107-238)	667
Age 12-19 years (2001 - 2002)	5.92 (4.46-7.87)	5.20 (3.70-7.60)	33.6 (18.0-56.8)	125 (91.2-172)	299 (172-435)	744
Age 12-19 years (2003 - 2004)	6.37 (4.95-8.18)	5.30 (3.80-8.10)	33.9 (18.2-50.5)	110 (82.2-198)	257 (175-415)	729
Age 12-19 years (2005 - 2006)	8.50 (6.48-11.2)	8.10 (5.50-11.6)	41.3 (33.6-49.6)	105 (80.2-213)	385 (139-829)	693
Age 12-19 years (2007 - 2008)	4.74 (3.00-7.48)	3.80 (2.20-7.20)	20.6 (11.2-34.6)	105 (29.5-357)	328 (78.1-638)	375
Age 12-19 years (2009 - 2010)	6.40 (4.93-8.31)	5.30 (4.00-7.70)	26.8 (16.6-47.8)	117 (77.8-165)	377 (156-965)	447
Age 20+ years (1999 - 2000)	4.05 (3.12-5.26)	4.46 (3.31-5.64)	19.8 (16.0-26.5)	101 (80.8-150)	228 (179-259)	1317
Age 20+ years (2001 - 2002)	3.65 (3.08-4.32)	2.80 (2.30-3.70)	17.0 (13.9-22.4)	81.5 (63.0-128)	260 (135-526)	1654
Age 20+ years (2003 - 2004)	4.56 (4.02-5.17)	4.40 (3.60-4.90)	22.0 (17.8-25.6)	94.0 (67.6-131)	230 (187-398)	1511
Age 20+ years (2005 - 2006)	4.09 (3.51-4.77)	3.20 (2.60-4.00)	17.9 (14.9-22.3)	91.2 (72.3-124)	248 (182-302)	1484
Age 20+ years (2007 - 2008)	4.41 (3.72-5.22)	3.20 (2.40-4.20)	23.0 (17.5-30.7)	133 (93.3-187)	320 (206-589)	1689
Age 20+ years (2009 - 2010)	4.28 (3.59-5.11)	3.00 (2.40-3.90)	19.3 (14.9-27.0)	127 (95.2-159)	438 (225-681)	1974
Males (1999 - 2000)	4.97 (3.71-6.66)	5.62 (4.12-8.73)	29.1 (19.8-42.9)	121 (74.1-190)	235 (177-332)	1087
Males (2001 - 2002)	3.81 (3.08-4.71)	3.30 (2.60-4.50)	17.4 (13.2-24.6)	82.8 (58.4-116)	194 (123-324)	1375
Males (2003 - 2004)	4.90 (3.93-6.12)	4.60 (3.40-5.50)	23.0 (16.6-30.1)	92.9 (70.7-129)	222 (159-332)	1240
Males (2005 - 2006)	4.93 (4.13-5.89)	4.00 (3.40-5.50)	22.3 (16.7-28.1)	90.8 (63.5-137)	235 (171-311)	1252
Males (2007 - 2008)	4.49 (3.67-5.49)	3.10 (2.50-4.10)	22.1 (14.5-33.7)	117 (81.4-194)	293 (195-589)	1198
Males (2009 - 2010)	4.39 (3.46-5.59)	3.30 (2.40-4.40)	18.1 (14.5-24.3)	99.2 (65.2-142)	293 (153-615)	1377
Females (1999 - 2000)	3.92 (2.97-5.16)	4.22 (3.18-5.51)	19.4 (14.1-26.1)	83.8 (61.1-114)	192 (123-250)	1184
Females (2001 - 2002)	4.36 (3.64-5.23)	3.40 (2.50-4.60)	21.3 (16.8-29.2)	107 (70.6-199)	394 (230-746)	1419
Females (2003 - 2004)	4.91 (4.26-5.66)	4.60 (3.90-5.50)	23.9 (18.1-27.4)	99.3 (63.5-155)	283 (160-433)	1341
Females (2005 - 2006)	4.50 (3.90-5.20)	3.30 (2.70-4.30)	22.8 (17.9-28.3)	121 (83.2-168)	284 (182-499)	1276
Females (2007 - 2008)	4.82 (4.03-5.75)	3.90 (2.90-5.30)	24.6 (18.1-33.9)	137 (99.3-195)	362 (236-468)	1226
Females (2009 - 2010)	5.09 (4.19-6.18)	3.90 (2.70-5.00)	28.5 (18.4-42.8)	152 (110-230)	494 (309-766)	1415

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.4, 0.2, 0.2, 0.2, and 0.2 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary O-Desmethylangolensin (1999 – 2010)‡

CAS Number 21255-69-6

Metabolite of Daidzein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	2.41 (1.55-3.73)	2.14 (1.31-3.37)	21.0 (10.6-30.5)	97.6 (59.7-140)	191 (122-320)	721
Mexican Americans (2001 - 2002)	2.44 (1.51-3.94)	1.40 (.500-3.40)	13.1 (5.80-27.6)	66.4 (33.5-102)	152 (75.8-265)	679
Mexican Americans (2003 - 2004)	2.54 (1.86-3.48)	1.90 (1.00-3.40)	14.4 (9.00-18.1)	62.3 (40.3-99.5)	146 (99.5-254)	652
Mexican Americans (2005 - 2006)	3.04 (2.29-4.05)	2.10 (1.40-2.90)	14.5 (8.20-24.7)	62.8 (39.1-104)	158 (87.0-246)	634
Mexican Americans (2007 - 2008)	3.16 (2.40-4.15)	2.50 (1.50-3.30)	14.7 (10.5-20.7)	84.9 (52.1-152)	211 (159-340)	520
Mexican Americans (2009 - 2010)	3.44 (2.78-4.27)	2.70 (2.10-3.50)	15.2 (10.6-21.2)	93.1 (63.5-114)	216 (127-294)	604
Non-Hispanic blacks (1999 - 2000)	5.74 (4.55-7.24)	8.71 (5.82-10.9)	33.5 (22.1-52.4)	108 (78.3-156)	192 (149-255)	538
Non-Hispanic blacks (2001 - 2002)	5.35 (4.00-7.14)	5.30 (2.90-7.30)	32.7 (22.0-52.4)	128 (75.9-216)	308 (150-436)	706
Non-Hispanic blacks (2003 - 2004)	5.49 (4.05-7.46)	4.20 (3.30-6.10)	26.1 (13.4-49.0)	117 (86.2-166)	221 (177-354)	698
Non-Hispanic blacks (2005 - 2006)	5.83 (4.49-7.58)	4.90 (3.90-6.30)	32.6 (21.2-46.7)	110 (72.4-189)	297 (162-398)	662
Non-Hispanic blacks (2007 - 2008)	6.63 (4.50-9.75)	5.80 (3.90-9.10)	40.8 (23.6-63.3)	183 (119-230)	347 (199-822)	562
Non-Hispanic blacks (2009 - 2010)	5.03 (3.75-6.74)	4.30 (2.90-6.00)	27.0 (16.7-35.9)	120 (80.5-168)	293 (168-464)	534
Non-Hispanic whites (1999 - 2000)	4.50 (3.26-6.22)	4.99 (3.43-7.10)	22.5 (17.1-34.4)	103 (72.0-152)	228 (177-259)	826
Non-Hispanic whites (2001 - 2002)	4.13 (3.43-4.96)	3.40 (2.60-4.40)	17.9 (15.5-23.8)	98.7 (67.4-153)	260 (153-526)	1222
Non-Hispanic whites (2003 - 2004)	5.27 (4.63-5.99)	5.30 (4.40-6.00)	24.2 (18.8-28.5)	99.5 (67.6-149)	246 (183-409)	1070
Non-Hispanic whites (2005 - 2006)	4.72 (4.09-5.45)	3.80 (3.20-4.70)	21.9 (17.5-27.6)	97.7 (72.3-142)	246 (181-363)	1039
Non-Hispanic whites (2007 - 2008)	4.67 (3.88-5.62)	3.50 (2.80-4.60)	21.3 (16.9-27.8)	113 (79.9-193)	357 (193-628)	993
Non-Hispanic whites (2009 - 2010)	4.95 (4.20-5.84)	3.70 (2.90-4.50)	20.4 (16.0-30.1)	139 (97.5-156)	471 (206-766)	1186

Limit of detection (LOD, see Data Analysis section) for Survey years 99-00, 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.2, 0.4, 0.2, 0.2, and 0.2 respectively.

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary O-Desmethylangolensin (creatinine corrected) (1999 – 2010)‡

CAS Number 21255-69-6

Metabolite of Daidzein

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (1999 - 2000)	4.03 (2.97-5.45)	4.44 (3.10-6.35)	21.8 (15.3-31.6)	90.4 (62.9-122)	167 (140-218)	2271
Total population (2001 - 2002)	3.83 (3.32-4.43)	3.24 (2.55-4.12)	18.9 (16.1-23.2)	85.2 (65.1-117)	281 (149-412)	2794
Total population (2003 - 2004)	4.58 (4.20-5.01)	4.09 (3.53-4.59)	19.6 (17.4-22.6)	92.9 (76.5-120)	201 (183-261)	2581
Total population (2005 - 2006)	4.59 (4.04-5.21)	3.70 (3.12-4.42)	20.7 (18.4-22.8)	95.6 (78.0-129)	215 (180-325)	2528
Total population (2007 - 2008)	4.68 (4.04-5.41)	3.51 (3.06-4.02)	22.5 (16.7-30.5)	125 (94.8-164)	350 (199-523)	2424
Total population (2009 - 2010)	5.07 (4.38-5.87)	3.78 (3.06-4.61)	23.6 (19.3-29.7)	138 (101-185)	433 (285-547)	2791
Age 6-11 years (1999 - 2000)	6.00 (4.04-8.91)	7.15 (3.94-16.6)	28.8 (14.3-45.0)	83.3 (45.0-167)	179 (88.2-262)	287
Age 6-11 years (2001 - 2002)	7.03 (5.05-9.77)	6.49 (4.24-11.6)	29.9 (16.3-54.1)	101 (75.3-199)	305 (134-464)	396
Age 6-11 years (2003 - 2004)	6.73 (4.55-9.97)	5.97 (4.09-8.28)	27.7 (15.6-42.3)	86.1 (45.2-135)	149 (84.3-189)	341
Age 6-11 years (2005 - 2006)	7.93 (5.73-11.0)	7.15 (3.90-11.3)	40.9 (27.5-55.9)	164 (85.8-280)	346 (215-497)	351
Age 6-11 years (2007 - 2008)	9.20 (6.70-12.6)	6.81 (5.05-10.7)	31.1 (20.1-58.9)	164 (100-296)	465 (175-2310)	360
Age 6-11 years (2009 - 2010)	10.7 (8.43-13.6)	9.58 (5.71-13.9)	43.0 (31.3-63.3)	201 (111-260)	330 (226-478)	370
Age 12-19 years (1999 - 2000)	4.13 (2.33-7.35)	5.71 (2.82-11.5)	26.0 (14.7-44.4)	71.4 (40.8-122)	122 (75.2-262)	667
Age 12-19 years (2001 - 2002)	4.57 (3.44-6.07)	3.88 (2.82-5.32)	26.0 (18.0-35.9)	95.0 (61.4-129)	259 (129-331)	744
Age 12-19 years (2003 - 2004)	4.76 (3.71-6.11)	4.26 (3.13-5.97)	22.8 (14.3-39.2)	86.4 (49.0-149)	185 (101-261)	729
Age 12-19 years (2005 - 2006)	6.30 (4.89-8.13)	5.69 (3.44-8.40)	28.0 (22.5-37.1)	89.0 (58.5-138)	258 (103-686)	693
Age 12-19 years (2007 - 2008)	3.64 (2.28-5.83)	2.99 (1.91-5.69)	18.3 (7.73-24.0)	75.3 (21.4-200)	199 (69.4-664)	375
Age 12-19 years (2009 - 2010)	6.02 (4.74-7.65)	5.71 (3.30-7.53)	23.6 (16.0-36.8)	109 (59.2-189)	287 (132-558)	447
Age 20+ years (1999 - 2000)	3.82 (2.84-5.13)	3.90 (2.69-5.73)	20.2 (12.9-29.2)	96.5 (61.8-133)	172 (140-252)	1317
Age 20+ years (2001 - 2002)	3.46 (2.95-4.04)	2.74 (2.03-3.64)	16.8 (13.7-20.3)	78.9 (58.2-124)	281 (143-467)	1654
Age 20+ years (2003 - 2004)	4.35 (3.96-4.78)	3.75 (3.23-4.35)	18.6 (15.7-22.6)	95.2 (76.5-131)	228 (192-284)	1511
Age 20+ years (2005 - 2006)	4.10 (3.51-4.79)	3.35 (2.57-4.30)	17.4 (14.0-20.6)	89.3 (64.5-140)	197 (160-332)	1484
Age 20+ years (2007 - 2008)	4.52 (3.82-5.36)	3.13 (2.55-3.92)	22.7 (16.1-32.4)	130 (89.1-183)	353 (189-641)	1689
Age 20+ years (2009 - 2010)	4.56 (3.83-5.42)	3.29 (2.42-4.07)	21.2 (16.2-26.8)	139 (95.3-212)	437 (246-634)	1974
Males (1999 - 2000)	3.95 (2.79-5.58)	4.50 (2.88-6.50)	24.5 (13.8-40.5)	96.5 (62.4-122)	210 (125-265)	1087
Males (2001 - 2002)	3.10 (2.48-3.86)	2.87 (2.00-3.96)	15.0 (10.4-19.7)	60.7 (41.5-90.2)	154 (96.4-301)	1375
Males (2003 - 2004)	3.83 (3.10-4.73)	3.33 (2.41-4.35)	15.6 (13.9-18.9)	76.2 (51.1-99.5)	193 (124-255)	1240
Males (2005 - 2006)	3.97 (3.33-4.72)	3.49 (2.73-4.33)	17.7 (14.1-21.4)	68.3 (55.8-85.8)	165 (140-216)	1252
Males (2007 - 2008)	3.79 (3.10-4.63)	2.79 (2.33-3.49)	18.2 (12.4-25.7)	86.7 (59.2-153)	264 (139-432)	1198
Males (2009 - 2010)	4.02 (3.10-5.19)	3.19 (2.13-4.58)	17.3 (12.3-21.7)	86.2 (59.8-137)	317 (140-485)	1376
Females (1999 - 2000)	4.10 (3.00-5.61)	4.17 (2.91-6.35)	20.4 (14.4-27.2)	86.0 (49.1-145)	155 (100-205)	1184
Females (2001 - 2002)	4.68 (3.87-5.68)	3.74 (2.77-4.88)	26.8 (18.7-34.0)	111 (70.3-205)	399 (175-739)	1419
Females (2003 - 2004)	5.45 (4.71-6.30)	4.82 (4.09-5.92)	24.3 (19.6-28.9)	106 (78.5-163)	255 (193-343)	1341
Females (2005 - 2006)	5.27 (4.56-6.09)	4.00 (3.07-5.49)	24.1 (19.8-31.1)	140 (96.8-166)	325 (197-613)	1276
Females (2007 - 2008)	5.72 (4.75-6.88)	4.23 (3.33-5.71)	29.0 (20.4-43.2)	164 (105-213)	394 (212-743)	1226
Females (2009 - 2010)	6.35 (5.34-7.57)	4.42 (3.46-5.79)	34.1 (25.4-43.5)	199 (139-248)	504 (350-761)	1415

‡Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary O-Desmethylangolensin (creatinine corrected) (1999 – 2010)†

CAS Number 21255-69-6

Metabolite of Daidzein

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (1999 - 2000)	2.19 (1.49-3.24)	1.88 (1.15-3.10)	16.6 (11.3-25.8)	71.2 (52.3-113)	136 (90.5-251)	721
Mexican Americans (2001 - 2002)	2.30 (1.48-3.57)	1.45 (.769-3.37)	11.8 (4.91-23.6)	46.7 (31.4-87.8)	108 (54.7-218)	679
Mexican Americans (2003 - 2004)	2.30 (1.68-3.15)	1.65 (.845-3.06)	13.2 (6.63-21.2)	51.6 (36.9-75.4)	125 (84.1-165)	652
Mexican Americans (2005 - 2006)	2.75 (1.92-3.93)	1.69 (1.04-2.99)	12.8 (7.27-24.9)	53.0 (33.3-93.2)	135 (72.6-204)	634
Mexican Americans (2007 - 2008)	3.10 (2.26-4.27)	2.22 (1.42-3.32)	16.0 (8.84-23.8)	82.0 (45.8-145)	215 (98.9-467)	520
Mexican Americans (2009 - 2010)	3.62 (2.92-4.50)	2.71 (1.82-4.92)	13.5 (10.8-19.6)	76.5 (54.2-128)	226 (113-461)	604
Non-Hispanic blacks (1999 - 2000)	3.65 (2.90-4.60)	5.22 (3.59-6.75)	23.8 (17.6-32.1)	67.1 (52.1-79.7)	116 (81.9-239)	538
Non-Hispanic blacks (2001 - 2002)	3.75 (2.76-5.10)	3.57 (2.14-5.48)	22.8 (14.5-30.4)	78.5 (46.5-175)	218 (98.5-339)	706
Non-Hispanic blacks (2003 - 2004)	3.89 (3.03-4.99)	3.12 (1.96-4.96)	16.9 (11.3-26.7)	80.0 (58.6-104)	159 (120-255)	698
Non-Hispanic blacks (2005 - 2006)	4.09 (3.13-5.34)	4.22 (2.49-5.71)	20.1 (13.5-24.5)	69.9 (44.8-151)	225 (90.2-369)	662
Non-Hispanic blacks (2007 - 2008)	5.13 (3.47-7.57)	4.22 (2.84-7.71)	27.0 (15.6-44.5)	133 (81.9-182)	308 (164-485)	562
Non-Hispanic blacks (2009 - 2010)	4.06 (3.11-5.28)	3.61 (2.41-5.07)	22.4 (12.9-30.2)	95.1 (59.2-142)	208 (133-418)	533
Non-Hispanic whites (1999 - 2000)	4.42 (3.12-6.27)	4.68 (3.05-7.23)	22.3 (15.3-37.9)	102 (57.6-148)	177 (140-215)	826
Non-Hispanic whites (2001 - 2002)	4.08 (3.41-4.89)	3.51 (2.45-4.57)	21.2 (16.3-27.4)	96.4 (69.8-126)	300 (153-464)	1222
Non-Hispanic whites (2003 - 2004)	5.18 (4.70-5.70)	4.58 (3.89-5.39)	21.6 (17.4-27.7)	103 (77.7-149)	225 (185-271)	1070
Non-Hispanic whites (2005 - 2006)	4.96 (4.33-5.69)	3.97 (3.26-4.67)	21.5 (17.3-26.2)	101 (74.5-142)	227 (183-332)	1039
Non-Hispanic whites (2007 - 2008)	4.86 (4.00-5.91)	3.85 (3.06-4.57)	22.2 (15.1-32.4)	124 (84.2-180)	355 (175-728)	993
Non-Hispanic whites (2009 - 2010)	5.55 (4.77-6.47)	3.88 (3.19-4.87)	23.8 (19.2-32.5)	146 (97.6-248)	461 (330-739)	1186

†Not measured after Survey years 2009-2010

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phytoestrogens_BiomonitoringSummary.html

Urinary 2-Hydroxyfluorene (2003 – 2010)

CAS Number 2443-58-5

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	304 (262-354)	280 (242-319)	679 (561-815)	1850 (1430-2190)	2670 (2230-3130)	2521
Total population (2005 - 2006)	316 (297-338)	272 (243-296)	661 (605-743)	2060 (1600-2420)	3150 (2670-3730)	2431
Total population (2007 - 2008)	303 (271-338)	259 (231-293)	618 (489-817)	1630 (1340-2020)	2510 (2100-2890)	2581
Total population (2009 - 2010)	240 (222-259)	211 (195-227)	480 (449-530)	1190 (1040-1410)	2200 (1880-2490)	2747
Age 6-11 years (2003 - 2004)	209 (183-239)	228 (189-259)	341 (295-411)	576 (423-728)	763 (613-827)	338
Age 6-11 years (2005 - 2006)	201 (184-221)	195 (170-223)	352 (306-402)	497 (436-618)	709 (536-833)	343
Age 6-11 years (2007 - 2008)	233 (205-264)	239 (194-280)	400 (326-454)	620 (484-714)	851 (695-1000)	382
Age 6-11 years (2009 - 2010)	172 (153-192)	170 (160-181)	278 (251-320)	458 (356-622)	743 (486-966)	416
Age 12-19 years (2003 - 2004)	281 (245-321)	292 (259-323)	502 (445-601)	1000 (753-1320)	1480 (1320-1930)	707
Age 12-19 years (2005 - 2006)	283 (258-311)	272 (247-300)	482 (425-540)	1080 (843-1250)	1750 (1100-2820)	670
Age 12-19 years (2007 - 2008)	287 (243-339)	255 (217-293)	541 (434-631)	963 (774-1350)	1510 (1050-2120)	395
Age 12-19 years (2009 - 2010)	231 (196-273)	203 (179-235)	418 (339-535)	784 (645-1230)	1880 (765-2410)	420
Age 20+ years (2003 - 2004)	323 (272-383)	290 (247-334)	832 (653-1020)	2090 (1680-2460)	2920 (2410-3650)	1476
Age 20+ years (2005 - 2006)	340 (311-371)	284 (252-317)	813 (705-917)	2410 (1880-2820)	3460 (2820-4160)	1418
Age 20+ years (2007 - 2008)	314 (276-357)	267 (231-306)	699 (518-1020)	1790 (1470-2220)	2700 (2190-3270)	1804
Age 20+ years (2009 - 2010)	250 (230-272)	220 (201-238)	537 (476-599)	1370 (1130-1650)	2330 (1990-2700)	1911
Males (2003 - 2004)	385 (333-446)	338 (300-415)	900 (739-1150)	2120 (1770-2450)	2930 (2490-3390)	1213
Males (2005 - 2006)	376 (345-410)	332 (302-364)	823 (658-1030)	2160 (1660-2570)	3120 (2570-3560)	1213
Males (2007 - 2008)	366 (334-402)	306 (280-348)	756 (613-983)	1740 (1430-2130)	2650 (2130-3270)	1280
Males (2009 - 2010)	275 (250-304)	234 (215-259)	536 (464-635)	1390 (1130-1710)	2350 (1990-2550)	1399
Females (2003 - 2004)	243 (204-290)	226 (184-269)	490 (405-617)	1400 (907-1930)	2310 (1740-3070)	1308
Females (2005 - 2006)	268 (234-307)	227 (199-270)	528 (445-638)	1910 (1020-2830)	3180 (2180-4590)	1218
Females (2007 - 2008)	252 (219-289)	216 (192-236)	505 (387-629)	1470 (1050-1960)	2330 (1770-2840)	1301
Females (2009 - 2010)	210 (189-232)	189 (170-213)	442 (389-506)	1050 (849-1270)	2090 (1370-2520)	1348

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyfluorene (2003 – 2010)

CAS Number 2443-58-5

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	248 (215-286)	235 (203-293)	502 (412-580)	1100 (771-1330)	1640 (1250-2240)	629
Mexican Americans (2005 - 2006)	233 (200-271)	216 (180-247)	413 (334-488)	901 (704-1080)	1360 (1060-1950)	615
Mexican Americans (2007 - 2008)	248 (226-273)	240 (215-261)	418 (355-496)	801 (643-979)	1300 (933-1680)	523
Mexican Americans (2009 - 2010)	214 (181-254)	197 (156-245)	385 (286-483)	860 (635-1130)	1800 (1070-2350)	566
Non-Hispanic blacks (2003 - 2004)	432 (360-519)	380 (314-462)	856 (695-1330)	2200 (1830-2650)	2970 (2310-4680)	666
Non-Hispanic blacks (2005 - 2006)	404 (346-471)	330 (307-377)	805 (626-1090)	2190 (1610-2930)	3160 (2530-4330)	657
Non-Hispanic blacks (2007 - 2008)	387 (333-450)	325 (281-403)	879 (724-1040)	1940 (1500-2550)	3170 (2290-5120)	590
Non-Hispanic blacks (2009 - 2010)	371 (317-433)	354 (314-401)	808 (620-1080)	1710 (1330-2280)	2580 (2090-3390)	517
Non-Hispanic whites (2003 - 2004)	306 (254-369)	274 (230-332)	708 (555-878)	1950 (1540-2390)	2920 (2400-3500)	1035
Non-Hispanic whites (2005 - 2006)	319 (290-350)	270 (237-315)	705 (626-829)	2180 (1700-2540)	3390 (2670-4250)	972
Non-Hispanic whites (2007 - 2008)	307 (261-362)	257 (221-308)	629 (452-995)	1720 (1260-2190)	2580 (2070-3020)	1070
Non-Hispanic whites (2009 - 2010)	228 (206-252)	199 (182-220)	457 (409-506)	1150 (921-1440)	2120 (1650-2550)	1203

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyfluorene (2011 – 2014)

CAS Number 2443-58-5

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	240 (219-263)	215 (199-231)	498 (444-576)	1380 (1110-1570)	2340 (1920-2620)	2492
Total population (2013 - 2014)	181 (165-197)	158 (146-174)	375 (319-431)	1020 (810-1260)	1650 (1430-1960)	2650
Age 6-11 years (2011 - 2012)	161 (146-177)	176 (166-194)	301 (259-332)	485 (390-595)	615 (522-736)	397
Age 6-11 years (2013 - 2014)	119 (108-132)	117 (105-131)	217 (191-261)	371 (302-458)	549 (445-682)	399
Age 12-19 years (2011 - 2012)	233 (198-274)	224 (180-275)	476 (386-567)	888 (679-1100)	1370 (1030-1950)	389
Age 12-19 years (2013 - 2014)	172 (139-212)	175 (128-227)	335 (285-424)	696 (531-860)	1140 (708-1430)	449
Age 20+ years (2011 - 2012)	252 (227-279)	217 (201-242)	574 (474-637)	1530 (1320-1830)	2420 (2180-2920)	1706
Age 20+ years (2013 - 2014)	190 (172-209)	161 (145-182)	410 (338-491)	1180 (951-1430)	1820 (1570-2140)	1802
Males (2011 - 2012)	280 (245-320)	244 (210-286)	584 (457-689)	1460 (1180-1830)	2390 (2050-3100)	1258
Males (2013 - 2014)	201 (184-220)	180 (160-195)	400 (338-462)	1060 (810-1280)	1670 (1270-2150)	1315
Females (2011 - 2012)	207 (182-236)	180 (157-209)	425 (360-525)	1210 (810-1580)	2260 (1620-2420)	1234
Females (2013 - 2014)	162 (146-180)	138 (121-158)	333 (283-423)	984 (716-1240)	1610 (1290-2160)	1335
Mexican Americans (2011 - 2012)	238 (184-307)	220 (180-252)	475 (306-747)	1030 (584-1780)	1510 (829-2920)	317
Mexican Americans (2013 - 2014)	154 (147-161)	146 (132-167)	298 (250-320)	500 (377-756)	857 (505-1100)	450
Non-Hispanic blacks (2011 - 2012)	342 (306-381)	321 (304-349)	641 (549-734)	1480 (1150-1890)	2390 (1970-3040)	664
Non-Hispanic blacks (2013 - 2014)	303 (264-347)	248 (220-294)	676 (569-820)	1630 (1210-2150)	2500 (1790-2930)	578
Non-Hispanic whites (2011 - 2012)	227 (210-246)	199 (173-221)	480 (386-580)	1410 (1110-1620)	2350 (1790-2920)	814
Non-Hispanic whites (2013 - 2014)	176 (155-198)	153 (135-174)	380 (306-480)	1060 (804-1290)	1770 (1440-2070)	979
All Hispanics (2011 - 2012)	251 (210-301)	228 (204-260)	514 (421-646)	1050 (785-1510)	1810 (1260-2410)	573
All Hispanics (2013 - 2014)	162 (148-177)	153 (135-178)	298 (259-333)	572 (412-853)	991 (694-1240)	698
Asians (2011 - 2012)	154 (126-190)	137 (111-175)	326 (217-408)	563 (467-903)	1100 (691-1490)	352
Asians (2013 - 2014)	103 (82.0-130)	100 (84.0-120)	172 (137-244)	322 (229-741)	741 (322-1150)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 10.0 and 8.0, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyfluorene (creatinine corrected) (2003 – 2010)

CAS Number 2443-58-5

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	286 (256-320)	221 (200-249)	495 (429-629)	1510 (1150-1800)	2070 (1850-2390)	2521
Total population (2005 - 2006)	308 (288-330)	227 (209-245)	567 (509-658)	1730 (1540-1850)	2450 (2020-2930)	2431
Total population (2007 - 2008)	304 (272-339)	234 (211-260)	526 (403-711)	1500 (1140-1780)	2150 (1850-2500)	2581
Total population (2009 - 2010)	250 (237-264)	193 (179-208)	392 (353-434)	1170 (1050-1290)	1840 (1620-1990)	2747
Age 6-11 years (2003 - 2004)	221 (199-246)	217 (188-238)	305 (270-356)	462 (370-535)	695 (465-807)	338
Age 6-11 years (2005 - 2006)	224 (207-243)	219 (197-254)	320 (288-365)	451 (384-523)	527 (450-720)	343
Age 6-11 years (2007 - 2008)	287 (255-324)	262 (240-292)	407 (355-503)	721 (555-849)	864 (757-956)	382
Age 6-11 years (2009 - 2010)	224 (207-242)	208 (186-232)	324 (296-336)	448 (361-677)	710 (448-1290)	416
Age 12-19 years (2003 - 2004)	213 (189-240)	189 (172-211)	310 (275-377)	649 (512-778)	937 (762-1320)	707
Age 12-19 years (2005 - 2006)	214 (201-227)	189 (178-197)	286 (266-320)	607 (516-769)	1190 (803-1430)	670
Age 12-19 years (2007 - 2008)	223 (200-249)	204 (176-236)	351 (270-419)	592 (504-683)	900 (683-1080)	395
Age 12-19 years (2009 - 2010)	186 (168-206)	154 (139-171)	251 (214-320)	569 (366-831)	858 (605-1190)	420
Age 20+ years (2003 - 2004)	310 (274-350)	233 (203-269)	659 (494-835)	1730 (1420-1940)	2310 (1930-2590)	1476
Age 20+ years (2005 - 2006)	339 (313-367)	241 (216-262)	754 (629-891)	1870 (1750-2110)	2830 (2250-3200)	1418
Age 20+ years (2007 - 2008)	321 (282-365)	234 (210-269)	633 (438-873)	1650 (1360-2060)	2390 (2090-2690)	1804
Age 20+ years (2009 - 2010)	265 (249-282)	199 (185-215)	463 (400-511)	1360 (1190-1490)	1970 (1750-2230)	1911
Males (2003 - 2004)	302 (271-337)	242 (218-272)	635 (494-758)	1510 (1200-1700)	1940 (1700-2310)	1213
Males (2005 - 2006)	302 (278-328)	233 (212-259)	610 (510-744)	1480 (1240-1680)	1920 (1680-2390)	1213
Males (2007 - 2008)	308 (283-336)	239 (218-261)	615 (464-764)	1480 (1200-1640)	2120 (1780-2390)	1280
Males (2009 - 2010)	247 (229-266)	188 (171-214)	417 (350-491)	1190 (955-1420)	1770 (1400-2220)	1399
Females (2003 - 2004)	271 (235-314)	208 (183-244)	415 (352-521)	1530 (991-1890)	2220 (1730-2590)	1308
Females (2005 - 2006)	314 (284-347)	217 (198-247)	526 (437-622)	1900 (1680-2240)	2930 (2310-3280)	1218
Females (2007 - 2008)	300 (257-350)	225 (201-265)	461 (347-683)	1510 (929-2100)	2250 (1630-2770)	1301
Females (2009 - 2010)	253 (232-276)	197 (178-217)	369 (320-433)	1130 (870-1380)	1900 (1490-2430)	1348

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyfluorene (creatinine corrected) (2003 – 2010)

CAS Number 2443-58-5

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	224 (197-255)	198 (178-227)	370 (306-432)	745 (562-1030)	1200 (745-1730)	629
Mexican Americans (2005 - 2006)	210 (190-232)	179 (155-205)	294 (250-368)	624 (439-834)	1000 (720-1190)	615
Mexican Americans (2007 - 2008)	244 (216-275)	214 (187-238)	364 (301-438)	718 (582-824)	958 (775-1480)	523
Mexican Americans (2009 - 2010)	213 (181-250)	171 (150-207)	316 (244-462)	667 (534-852)	1180 (846-1470)	566
Non-Hispanic blacks (2003 - 2004)	306 (259-360)	245 (207-295)	609 (430-756)	1390 (939-1870)	1880 (1510-2430)	666
Non-Hispanic blacks (2005 - 2006)	284 (250-322)	222 (202-245)	502 (350-714)	1230 (941-1760)	1880 (1510-2440)	657
Non-Hispanic blacks (2007 - 2008)	299 (254-351)	237 (198-287)	602 (468-768)	1370 (1050-1910)	2220 (1570-2990)	590
Non-Hispanic blacks (2009 - 2010)	269 (241-300)	214 (193-244)	501 (383-653)	1220 (1010-1410)	1620 (1280-1950)	517
Non-Hispanic whites (2003 - 2004)	303 (265-346)	225 (198-259)	561 (450-765)	1620 (1420-1940)	2310 (1940-2540)	1035
Non-Hispanic whites (2005 - 2006)	335 (307-366)	242 (216-270)	687 (561-806)	1840 (1650-2060)	2800 (2070-3260)	972
Non-Hispanic whites (2007 - 2008)	319 (274-372)	238 (205-290)	579 (393-841)	1620 (1180-2090)	2340 (1940-2640)	1070
Non-Hispanic whites (2009 - 2010)	256 (242-271)	196 (178-214)	381 (338-451)	1260 (1090-1490)	1940 (1690-2220)	1203

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyfluorene (creatinine corrected) (2011 – 2014)

CAS Number 2443-58-5

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	273 (255-292)	211 (196-228)	439 (374-495)	1340 (1120-1570)	2110 (1930-2250)	2490
Total population (2013 - 2014)	209 (194-226)	167 (155-182)	319 (283-359)	942 (768-1130)	1460 (1280-1650)	2649
Age 6-11 years (2011 - 2012)	231 (213-251)	222 (201-243)	309 (268-371)	474 (379-567)	584 (515-702)	396
Age 6-11 years (2013 - 2014)	179 (164-196)	175 (153-196)	242 (215-289)	354 (316-373)	456 (366-659)	399
Age 12-19 years (2011 - 2012)	225 (205-248)	205 (180-242)	307 (266-368)	733 (454-877)	966 (733-1150)	389
Age 12-19 years (2013 - 2014)	156 (140-173)	136 (120-152)	208 (191-245)	416 (313-661)	767 (502-1270)	449
Age 20+ years (2011 - 2012)	286 (266-309)	211 (195-229)	484 (420-615)	1630 (1320-1820)	2230 (2000-2630)	1705
Age 20+ years (2013 - 2014)	222 (205-241)	173 (157-188)	355 (315-417)	1070 (845-1270)	1610 (1350-1810)	1801
Males (2011 - 2012)	262 (233-296)	201 (183-228)	439 (342-576)	1320 (1060-1630)	2040 (1710-2200)	1257
Males (2013 - 2014)	202 (186-218)	163 (152-182)	323 (292-364)	806 (626-1100)	1300 (1000-1680)	1314
Females (2011 - 2012)	284 (255-316)	218 (199-242)	439 (338-527)	1370 (920-1820)	2220 (1820-2570)	1233
Females (2013 - 2014)	217 (197-238)	172 (155-185)	316 (261-386)	1070 (845-1260)	1550 (1320-1810)	1335
Mexican Americans (2011 - 2012)	267 (222-322)	221 (183-264)	440 (283-647)	1020 (515-1500)	1350 (937-2460)	317
Mexican Americans (2013 - 2014)	176 (163-191)	149 (137-167)	261 (220-321)	468 (377-710)	832 (474-1230)	450
Non-Hispanic blacks (2011 - 2012)	266 (241-294)	228 (203-244)	461 (339-619)	971 (841-1090)	1460 (1090-1930)	664
Non-Hispanic blacks (2013 - 2014)	231 (206-260)	178 (155-225)	451 (383-576)	1110 (892-1160)	1460 (1190-1520)	578
Non-Hispanic whites (2011 - 2012)	276 (260-293)	208 (189-228)	445 (374-501)	1600 (1310-1820)	2220 (1950-2630)	812
Non-Hispanic whites (2013 - 2014)	217 (197-240)	172 (154-188)	325 (278-394)	1070 (785-1320)	1640 (1340-1860)	978
All Hispanics (2011 - 2012)	281 (248-319)	225 (199-255)	445 (337-553)	1110 (642-1460)	1550 (1170-2180)	573
All Hispanics (2013 - 2014)	182 (165-200)	159 (141-177)	265 (220-323)	512 (424-724)	943 (752-1220)	698
Asians (2011 - 2012)	207 (174-246)	185 (156-233)	299 (262-351)	532 (401-828)	996 (643-1420)	352
Asians (2013 - 2014)	162 (136-192)	150 (120-178)	238 (189-336)	435 (290-755)	755 (414-847)	291

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyfluorene (2001 – 2010)

CAS Number 6344-67-8

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	134 (115-155)	111 (96.0-126)	253 (207-349)	959 (666-1300)	1620 (1390-1900)	2745
Total population (2003 - 2004)	126 (108-148)	103 (90.4-118)	302 (231-404)	1090 (934-1270)	1740 (1400-2070)	2502
Total population (2005 - 2006)	124 (115-134)	99.1 (88.5-110)	304 (268-365)	1060 (830-1210)	1780 (1500-1910)	2398
Total population (2007 - 2008)	116 (103-132)	92.9 (85.7-100)	258 (203-341)	821 (681-1050)	1380 (1170-1630)	2581
Total population (2009 - 2010)	95.0 (87.9-103)	78.0 (71.0-84.0)	192 (174-208)	623 (501-741)	1050 (941-1270)	2744
Age 6-11 years (2001 - 2002)	106 (94.8-119)	106 (91.0-124)	174 (145-200)	287 (235-358)	385 (306-455)	387
Age 6-11 years (2003 - 2004)	89.2 (77.3-103)	92.3 (79.7-103)	151 (113-172)	238 (184-331)	343 (241-423)	336
Age 6-11 years (2005 - 2006)	81.7 (73.6-90.7)	80.6 (68.3-98.9)	140 (122-174)	235 (189-272)	287 (242-345)	336
Age 6-11 years (2007 - 2008)	98.0 (85.8-112)	94.2 (84.3-106)	178 (149-198)	302 (239-332)	458 (247-752)	382
Age 6-11 years (2009 - 2010)	73.8 (66.7-81.7)	74.0 (65.0-82.0)	113 (103-129)	194 (164-249)	308 (202-453)	416
Age 12-19 years (2001 - 2002)	129 (103-161)	113 (97.0-137)	222 (177-266)	542 (325-1070)	1210 (680-2130)	733
Age 12-19 years (2003 - 2004)	116 (100-134)	114 (94.7-133)	214 (181-269)	476 (317-748)	924 (609-1410)	701
Age 12-19 years (2005 - 2006)	119 (107-133)	112 (94.4-126)	212 (181-229)	588 (436-659)	986 (609-1800)	661
Age 12-19 years (2007 - 2008)	114 (95.5-136)	93.7 (77.4-114)	218 (168-258)	494 (341-740)	830 (725-1020)	400
Age 12-19 years (2009 - 2010)	96.0 (79.7-116)	85.0 (65.0-104)	178 (139-215)	394 (257-643)	798 (550-1030)	420
Age 20+ years (2001 - 2002)	138 (119-161)	111 (94.0-129)	311 (228-429)	1130 (823-1400)	1850 (1470-2080)	1625
Age 20+ years (2003 - 2004)	134 (112-160)	105 (86.5-125)	408 (300-537)	1240 (1050-1480)	1910 (1620-2290)	1465
Age 20+ years (2005 - 2006)	131 (118-145)	101 (86.2-117)	394 (308-448)	1220 (968-1510)	1900 (1620-2050)	1401
Age 20+ years (2007 - 2008)	119 (103-138)	91.4 (83.5-100)	302 (205-449)	992 (745-1200)	1550 (1230-1820)	1799
Age 20+ years (2009 - 2010)	97.5 (90.1-106)	79.0 (71.0-84.0)	217 (185-253)	711 (542-820)	1230 (978-1490)	1908
Males (2001 - 2002)	163 (137-194)	134 (115-155)	352 (242-481)	1110 (721-1500)	1850 (1390-2190)	1346
Males (2003 - 2004)	165 (140-194)	133 (108-162)	458 (313-681)	1270 (1030-1530)	1920 (1580-2120)	1205
Males (2005 - 2006)	155 (138-174)	127 (118-136)	420 (304-510)	1130 (887-1330)	1810 (1440-2050)	1196
Males (2007 - 2008)	146 (131-162)	115 (103-132)	330 (262-450)	944 (748-1190)	1530 (1160-1940)	1284
Males (2009 - 2010)	111 (99.3-124)	87.0 (75.0-102)	214 (183-272)	718 (549-806)	1190 (982-1390)	1397
Females (2001 - 2002)	111 (95.0-130)	94.0 (83.0-108)	204 (169-250)	796 (498-1040)	1390 (1250-1670)	1399
Females (2003 - 2004)	98.2 (81.2-119)	80.5 (66.7-101)	195 (163-272)	842 (530-1200)	1590 (1180-1800)	1297
Females (2005 - 2006)	99.9 (87.0-115)	78.2 (68.3-88.3)	225 (176-278)	961 (558-1390)	1720 (1300-2020)	1202
Females (2007 - 2008)	93.9 (81.2-109)	77.2 (70.4-83.8)	192 (134-276)	688 (457-1090)	1280 (1030-1590)	1297
Females (2009 - 2010)	82.0 (74.7-90.0)	69.0 (62.0-77.0)	174 (155-194)	514 (388-677)	958 (757-1370)	1347

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 2.0, 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyfluorene (2001 – 2010)

CAS Number 6344-67-8

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	108 (87.1-134)	99.0 (81.0-119)	190 (144-255)	476 (302-641)	718 (476-1140)	662
Mexican Americans (2003 - 2004)	93.4 (79.6-110)	83.4 (67.0-96.9)	190 (150-252)	520 (388-726)	1030 (688-1320)	622
Mexican Americans (2005 - 2006)	82.5 (71.0-95.8)	71.8 (60.2-83.9)	143 (116-173)	435 (265-716)	763 (565-1020)	596
Mexican Americans (2007 - 2008)	90.4 (79.6-103)	81.2 (74.5-92.4)	160 (136-192)	363 (259-513)	674 (454-1180)	529
Mexican Americans (2009 - 2010)	77.8 (67.1-90.1)	65.0 (51.0-80.0)	149 (108-207)	390 (296-470)	750 (464-1020)	564
Non-Hispanic blacks (2001 - 2002)	203 (169-244)	162 (135-188)	449 (308-830)	1420 (1130-1780)	2350 (1520-3000)	692
Non-Hispanic blacks (2003 - 2004)	194 (156-242)	156 (124-184)	466 (297-869)	1480 (1170-1810)	2180 (1620-2830)	665
Non-Hispanic blacks (2005 - 2006)	170 (143-202)	134 (121-149)	345 (246-558)	1300 (929-1760)	1880 (1550-2370)	652
Non-Hispanic blacks (2007 - 2008)	164 (142-190)	133 (112-157)	393 (303-494)	1290 (963-1420)	1770 (1330-2660)	587
Non-Hispanic blacks (2009 - 2010)	163 (134-198)	144 (120-167)	389 (255-670)	1100 (804-1360)	1670 (1230-2010)	517
Non-Hispanic whites (2001 - 2002)	130 (108-157)	108 (93.0-127)	246 (202-352)	948 (621-1320)	1620 (1320-1990)	1207
Non-Hispanic whites (2003 - 2004)	128 (106-155)	104 (86.2-124)	311 (233-452)	1210 (1010-1410)	1870 (1430-2290)	1025
Non-Hispanic whites (2005 - 2006)	123 (111-137)	96.8 (85.4-112)	343 (275-420)	1060 (760-1260)	1870 (1390-2050)	966
Non-Hispanic whites (2007 - 2008)	118 (98.0-141)	91.6 (81.6-103)	274 (195-403)	857 (646-1190)	1370 (1050-1740)	1066
Non-Hispanic whites (2009 - 2010)	89.5 (80.7-99.4)	73.0 (64.0-84.0)	174 (156-194)	545 (403-732)	973 (806-1280)	1202

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 2.0, 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyfluorene (2011 – 2014)

CAS Number 6344-67-8

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	93.6 (85.2-103)	77.0 (70.0-85.0)	195 (166-226)	688 (505-851)	1240 (946-1690)	2488
Total population (2013 - 2014)	79.9 (72.5-88.0)	69.0 (61.0-74.0)	166 (143-207)	577 (479-675)	1010 (782-1300)	2650
Age 6-11 years (2011 - 2012)	69.9 (63.1-77.3)	77.0 (66.0-91.0)	132 (118-145)	203 (178-229)	244 (224-270)	397
Age 6-11 years (2013 - 2014)	57.7 (51.9-64.3)	58.0 (51.0-63.0)	98.0 (85.0-115)	177 (149-227)	266 (215-394)	399
Age 12-19 years (2011 - 2012)	91.7 (77.7-108)	86.0 (73.0-109)	182 (153-208)	398 (269-681)	801 (473-1050)	389
Age 12-19 years (2013 - 2014)	79.9 (65.4-97.7)	76.0 (59.0-99.0)	154 (123-183)	337 (220-564)	611 (337-1000)	449
Age 20+ years (2011 - 2012)	97.0 (87.0-108)	76.0 (67.0-85.0)	221 (172-271)	809 (614-968)	1410 (1090-1810)	1702
Age 20+ years (2013 - 2014)	82.6 (74.0-92.3)	69.0 (60.0-75.0)	186 (149-242)	660 (532-782)	1210 (941-1440)	1802
Males (2011 - 2012)	112 (95.1-132)	92.0 (78.0-108)	225 (167-302)	857 (517-1030)	1630 (969-1990)	1257
Males (2013 - 2014)	93.6 (84.4-104)	79.0 (72.0-87.0)	187 (157-242)	613 (480-774)	1070 (767-1450)	1315
Females (2011 - 2012)	78.8 (68.1-91.1)	66.0 (58.0-76.0)	166 (135-205)	556 (399-715)	1030 (804-1340)	1231
Females (2013 - 2014)	68.5 (61.6-76.3)	56.0 (50.0-65.0)	142 (116-185)	532 (393-666)	999 (680-1320)	1335
Mexican Americans (2011 - 2012)	86.4 (64.9-115)	75.0 (58.0-95.0)	176 (114-289)	426 (229-949)	835 (311-1640)	315
Mexican Americans (2013 - 2014)	62.4 (57.6-67.5)	59.0 (52.0-69.0)	116 (98.0-132)	213 (193-283)	422 (247-544)	450
Non-Hispanic blacks (2011 - 2012)	143 (128-159)	122 (109-137)	281 (220-335)	879 (639-1140)	1600 (1190-1980)	663
Non-Hispanic blacks (2013 - 2014)	155 (133-181)	122 (99.0-152)	369 (283-522)	1250 (716-1820)	1940 (1390-2430)	578
Non-Hispanic whites (2011 - 2012)	88.9 (82.3-96.0)	70.0 (63.0-78.0)	183 (155-223)	700 (515-837)	1220 (857-1930)	813
Non-Hispanic whites (2013 - 2014)	77.2 (67.4-88.4)	63.0 (57.0-73.0)	170 (132-226)	583 (464-760)	1010 (767-1320)	979
All Hispanics (2011 - 2012)	92.6 (75.9-113)	77.0 (68.0-97.0)	199 (148-258)	473 (300-835)	946 (543-1330)	571
All Hispanics (2013 - 2014)	66.6 (59.4-74.8)	62.0 (53.0-75.0)	118 (102-137)	283 (182-497)	561 (293-804)	698
Asians (2011 - 2012)	57.8 (47.9-69.8)	49.0 (41.0-64.0)	126 (96.0-151)	230 (184-373)	555 (295-781)	352
Asians (2013 - 2014)	43.0 (34.1-54.1)	42.0 (33.0-50.0)	74.0 (56.0-103)	156 (102-317)	317 (156-618)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 10.0 and 8.0, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyfluorene (creatinine corrected) (2001 – 2010)

CAS Number 6344-67-8

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	125 (108-144)	94.4 (83.3-106)	220 (174-303)	754 (622-873)	1060 (909-1290)	2745
Total population (2003 - 2004)	119 (106-134)	86.6 (76.8-97.3)	256 (201-337)	856 (668-1060)	1330 (1130-1590)	2502
Total population (2005 - 2006)	121 (111-131)	84.5 (77.5-93.4)	245 (203-297)	930 (806-1020)	1280 (1150-1400)	2398
Total population (2007 - 2008)	117 (104-132)	84.6 (76.8-98.5)	226 (177-310)	789 (601-1000)	1230 (1040-1410)	2581
Total population (2009 - 2010)	99.2 (93.0-106)	76.0 (69.7-84.0)	157 (144-180)	568 (521-662)	988 (914-1070)	2744
Age 6-11 years (2001 - 2002)	119 (103-137)	110 (96.7-121)	153 (135-197)	265 (206-377)	382 (254-631)	387
Age 6-11 years (2003 - 2004)	94.6 (84.3-106)	92.4 (83.1-98.5)	130 (115-154)	202 (168-282)	311 (197-435)	336
Age 6-11 years (2005 - 2006)	90.7 (82.6-99.6)	90.3 (80.1-99.7)	130 (119-142)	210 (167-242)	290 (237-353)	336
Age 6-11 years (2007 - 2008)	120 (105-138)	108 (92.3-127)	186 (150-215)	330 (231-401)	419 (304-918)	382
Age 6-11 years (2009 - 2010)	96.3 (89.9-103)	89.5 (82.4-96.5)	130 (120-145)	228 (173-262)	304 (235-430)	416
Age 12-19 years (2001 - 2002)	99.3 (81.6-121)	81.9 (74.2-92.6)	144 (109-197)	390 (214-700)	711 (372-1380)	733
Age 12-19 years (2003 - 2004)	88.1 (78.0-99.6)	79.0 (72.5-83.2)	137 (114-170)	319 (225-440)	586 (356-880)	701
Age 12-19 years (2005 - 2006)	90.1 (84.3-96.3)	73.8 (70.0-81.7)	133 (112-153)	381 (323-426)	618 (437-819)	661
Age 12-19 years (2007 - 2008)	88.5 (78.9-99.2)	74.8 (65.2-84.6)	141 (118-185)	317 (242-449)	515 (338-656)	400
Age 12-19 years (2009 - 2010)	77.2 (68.4-87.1)	64.1 (57.0-72.7)	103 (87.0-138)	257 (211-368)	475 (355-600)	420
Age 20+ years (2001 - 2002)	131 (113-151)	94.4 (81.0-108)	279 (195-367)	862 (727-923)	1210 (1010-1350)	1625
Age 20+ years (2003 - 2004)	128 (113-146)	88.2 (76.8-104)	364 (242-484)	1020 (828-1240)	1500 (1290-1710)	1465
Age 20+ years (2005 - 2006)	131 (119-144)	85.9 (77.1-98.5)	334 (251-476)	1020 (931-1180)	1380 (1220-1550)	1401
Age 20+ years (2007 - 2008)	122 (106-142)	83.9 (76.0-99.9)	276 (186-389)	926 (710-1110)	1320 (1150-1500)	1799
Age 20+ years (2009 - 2010)	103 (96.3-111)	76.2 (69.6-85.9)	185 (157-213)	710 (600-779)	1070 (966-1120)	1908
Males (2001 - 2002)	132 (111-156)	100 (88.5-117)	260 (194-361)	745 (560-914)	1130 (862-1380)	1346
Males (2003 - 2004)	129 (114-147)	95.8 (82.5-111)	338 (226-456)	833 (672-1010)	1220 (980-1510)	1205
Males (2005 - 2006)	125 (112-139)	92.4 (84.3-103)	272 (215-404)	784 (660-936)	1100 (874-1310)	1196
Males (2007 - 2008)	123 (111-136)	92.3 (80.8-105)	282 (227-354)	791 (675-969)	1110 (989-1330)	1284
Males (2009 - 2010)	99.4 (90.3-110)	74.3 (65.3-85.9)	167 (149-199)	616 (494-739)	948 (736-1140)	1397
Females (2001 - 2002)	119 (104-136)	88.9 (78.6-103)	179 (156-227)	777 (604-888)	1030 (923-1270)	1399
Females (2003 - 2004)	110 (93.4-129)	81.7 (69.5-91.5)	183 (132-285)	920 (488-1270)	1460 (1130-1750)	1297
Females (2005 - 2006)	117 (105-130)	77.6 (71.9-90.2)	203 (160-290)	1040 (836-1240)	1400 (1220-1780)	1202
Females (2007 - 2008)	112 (95.7-131)	82.1 (72.7-96.8)	180 (132-265)	789 (450-1140)	1240 (1050-1500)	1297
Females (2009 - 2010)	98.9 (90.8-108)	76.4 (69.7-86.8)	149 (134-179)	529 (441-728)	1040 (801-1200)	1347

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyfluorene (creatinine corrected) (2001 – 2010)

CAS Number 6344-67-8

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	101 (84.2-121)	84.0 (74.8-97.2)	159 (124-214)	364 (227-598)	604 (357-1230)	662
Mexican Americans (2003 - 2004)	84.8 (73.1-98.4)	68.8 (60.0-80.2)	170 (119-213)	353 (319-435)	668 (353-1050)	622
Mexican Americans (2005 - 2006)	74.0 (66.0-83.1)	59.9 (52.5-69.7)	112 (88.0-136)	282 (217-410)	585 (320-763)	596
Mexican Americans (2007 - 2008)	88.1 (75.3-103)	72.7 (62.2-84.1)	141 (107-184)	366 (232-536)	568 (397-722)	529
Mexican Americans (2009 - 2010)	77.3 (67.1-89.1)	61.6 (52.6-72.6)	126 (96.0-160)	344 (252-479)	609 (373-905)	564
Non-Hispanic blacks (2001 - 2002)	143 (118-173)	110 (90.7-133)	316 (186-525)	849 (622-1230)	1240 (882-1430)	692
Non-Hispanic blacks (2003 - 2004)	138 (114-167)	106 (91.7-117)	316 (203-475)	948 (554-1310)	1310 (963-1710)	665
Non-Hispanic blacks (2005 - 2006)	119 (103-138)	87.4 (78.4-97.0)	214 (154-388)	711 (523-1000)	1100 (838-1380)	652
Non-Hispanic blacks (2007 - 2008)	128 (109-150)	94.1 (82.2-110)	309 (204-433)	829 (715-981)	1310 (981-1640)	587
Non-Hispanic blacks (2009 - 2010)	118 (102-137)	87.1 (73.8-104)	260 (173-397)	729 (559-860)	958 (784-1190)	517
Non-Hispanic whites (2001 - 2002)	128 (108-152)	94.7 (83.4-109)	223 (171-323)	816 (642-914)	1150 (910-1410)	1207
Non-Hispanic whites (2003 - 2004)	127 (110-145)	89.8 (79.5-103)	305 (211-403)	975 (768-1170)	1460 (1270-1700)	1025
Non-Hispanic whites (2005 - 2006)	130 (117-144)	91.1 (81.0-104)	290 (229-426)	973 (836-1180)	1380 (1130-1570)	966
Non-Hispanic whites (2007 - 2008)	122 (103-145)	89.3 (76.2-108)	244 (166-377)	895 (579-1110)	1250 (1080-1470)	1066
Non-Hispanic whites (2009 - 2010)	101 (93.2-109)	76.6 (68.9-88.4)	154 (140-184)	627 (516-739)	1070 (918-1140)	1202

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyfluorene (creatinine corrected) (2011 – 2014)

CAS Number 6344-67-8

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	107 (99.8-114)	80.6 (76.7-83.3)	185 (155-225)	753 (588-826)	1170 (1040-1330)	2486
Total population (2013 - 2014)	92.6 (85.1-101)	69.9 (65.0-76.5)	155 (131-184)	563 (452-680)	933 (881-1080)	2649
Age 6-11 years (2011 - 2012)	100 (90.6-111)	93.3 (86.2-106)	138 (120-168)	210 (176-256)	281 (220-349)	396
Age 6-11 years (2013 - 2014)	86.6 (77.8-96.5)	84.7 (69.7-98.8)	120 (105-149)	182 (162-218)	277 (193-327)	399
Age 12-19 years (2011 - 2012)	88.6 (78.9-99.5)	79.4 (70.0-88.4)	122 (109-173)	273 (223-392)	519 (329-698)	389
Age 12-19 years (2013 - 2014)	72.4 (65.6-80.0)	63.6 (49.4-72.1)	103 (91.7-121)	241 (173-426)	501 (266-778)	449
Age 20+ years (2011 - 2012)	110 (102-119)	78.3 (73.1-83.1)	220 (177-262)	832 (754-1030)	1230 (1100-1530)	1701
Age 20+ years (2013 - 2014)	96.7 (87.9-106)	69.8 (64.0-77.3)	176 (143-236)	662 (531-825)	1060 (921-1140)	1801
Males (2011 - 2012)	105 (90.1-122)	78.7 (70.5-86.7)	195 (137-279)	754 (493-1010)	1200 (894-1470)	1256
Males (2013 - 2014)	93.7 (85.2-103)	72.7 (65.0-81.0)	166 (134-204)	519 (385-691)	933 (676-1120)	1314
Females (2011 - 2012)	108 (94.7-123)	81.8 (75.0-88.9)	181 (144-235)	702 (439-964)	1130 (960-1380)	1230
Females (2013 - 2014)	91.5 (82.7-101)	68.6 (63.8-74.3)	140 (117-176)	602 (467-706)	937 (882-1140)	1335
Mexican Americans (2011 - 2012)	96.7 (77.8-120)	78.0 (63.7-91.3)	149 (121-220)	535 (219-765)	765 (510-1110)	315
Mexican Americans (2013 - 2014)	71.5 (64.2-79.6)	59.6 (53.9-64.4)	112 (91.6-134)	252 (163-363)	439 (271-563)	450
Non-Hispanic blacks (2011 - 2012)	111 (101-121)	86.8 (81.3-95.1)	217 (183-267)	610 (456-758)	932 (753-1100)	663
Non-Hispanic blacks (2013 - 2014)	119 (104-136)	87.9 (71.7-101)	262 (180-402)	837 (643-930)	1100 (942-1240)	578
Non-Hispanic whites (2011 - 2012)	108 (102-114)	80.0 (75.0-85.4)	199 (163-230)	822 (644-1040)	1230 (1100-1560)	811
Non-Hispanic whites (2013 - 2014)	95.5 (85.3-107)	71.4 (64.7-79.1)	162 (126-214)	611 (452-825)	1060 (891-1200)	978
All Hispanics (2011 - 2012)	103 (89.2-120)	82.9 (73.1-94.6)	163 (130-219)	554 (301-749)	839 (610-1110)	571
All Hispanics (2013 - 2014)	74.6 (66.6-83.5)	60.8 (55.4-71.1)	115 (97.6-133)	295 (188-395)	563 (358-871)	698
Asians (2011 - 2012)	77.5 (65.6-91.5)	71.0 (60.6-77.8)	114 (93.8-143)	236 (178-363)	474 (317-694)	352
Asians (2013 - 2014)	67.4 (57.2-79.5)	57.1 (52.6-68.4)	109 (77.8-155)	211 (151-336)	345 (212-643)	291

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 9-Hydroxyfluorene (2003 – 2010)

CAS Number 1689-64-1

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	267 (234-305)	269 (233-313)	541 (463-620)	929 (839-1060)	1390 (1130-1600)	2504
Total population (2005 - 2006)	308 (289-328)	300 (271-325)	609 (563-652)	1270 (1090-1420)	1820 (1560-2110)	2422
Total population (2007 - 2008)	337 (310-367)	327 (295-367)	677 (582-769)	1300 (1060-1490)	1960 (1670-2420)	2608
Total population (2009 - 2010)	255 (239-272)	253 (229-273)	514 (464-557)	981 (911-1060)	1510 (1290-1700)	2747
Age 6-11 years (2003 - 2004)	209 (184-238)	216 (173-240)	331 (267-458)	594 (446-809)	853 (553-1500)	333
Age 6-11 years (2005 - 2006)	184 (162-209)	190 (153-210)	324 (261-397)	657 (448-783)	823 (671-1220)	342
Age 6-11 years (2007 - 2008)	242 (208-282)	229 (196-280)	449 (326-580)	791 (565-1040)	1090 (787-1610)	389
Age 6-11 years (2009 - 2010)	164 (144-186)	150 (132-182)	291 (254-351)	518 (424-727)	809 (522-1220)	416
Age 12-19 years (2003 - 2004)	253 (216-297)	271 (215-324)	506 (413-560)	894 (773-988)	1210 (929-1510)	698
Age 12-19 years (2005 - 2006)	266 (245-290)	278 (253-314)	528 (454-574)	842 (738-1020)	1290 (1070-1510)	668
Age 12-19 years (2007 - 2008)	308 (255-371)	295 (241-374)	583 (459-736)	1050 (829-1290)	1400 (1080-1870)	401
Age 12-19 years (2009 - 2010)	237 (203-278)	235 (186-303)	475 (398-544)	813 (663-954)	1100 (846-1580)	420
Age 20+ years (2003 - 2004)	277 (240-320)	279 (237-335)	583 (476-656)	979 (842-1140)	1490 (1140-1770)	1473
Age 20+ years (2005 - 2006)	335 (309-363)	323 (292-349)	653 (593-729)	1360 (1180-1610)	1950 (1650-2530)	1412
Age 20+ years (2007 - 2008)	355 (323-390)	352 (311-384)	716 (629-835)	1410 (1170-1670)	2160 (1770-2780)	1818
Age 20+ years (2009 - 2010)	271 (251-291)	267 (245-296)	546 (496-596)	1060 (960-1130)	1590 (1340-1900)	1911
Males (2003 - 2004)	330 (291-374)	330 (285-372)	632 (583-709)	1090 (898-1370)	1720 (1360-2250)	1208
Males (2005 - 2006)	355 (325-387)	334 (296-387)	693 (608-783)	1310 (1150-1620)	2000 (1670-2560)	1208
Males (2007 - 2008)	401 (365-441)	394 (356-442)	778 (661-897)	1420 (1260-1580)	2120 (1770-2820)	1294
Males (2009 - 2010)	286 (261-313)	283 (255-317)	555 (492-632)	985 (900-1060)	1580 (1320-1750)	1399
Females (2003 - 2004)	218 (188-253)	226 (191-253)	439 (357-521)	833 (697-973)	1100 (955-1310)	1296
Females (2005 - 2006)	269 (242-299)	257 (230-297)	503 (426-580)	1090 (845-1400)	1610 (1400-1920)	1214
Females (2007 - 2008)	286 (260-313)	271 (246-299)	557 (474-671)	1110 (914-1400)	1830 (1400-2400)	1314
Females (2009 - 2010)	228 (213-244)	223 (208-244)	464 (432-501)	964 (850-1080)	1470 (1240-1700)	1348

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 9-Hydroxyfluorene (2003 – 2010)

CAS Number 1689-64-1

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	229 (200-261)	232 (197-274)	435 (362-492)	773 (561-1010)	1030 (849-1170)	614
Mexican Americans (2005 - 2006)	232 (204-264)	221 (186-262)	407 (361-435)	738 (596-840)	1030 (788-1470)	614
Mexican Americans (2007 - 2008)	267 (246-288)	259 (236-285)	476 (430-515)	859 (732-1100)	1470 (1070-1980)	532
Mexican Americans (2009 - 2010)	214 (187-246)	197 (158-245)	416 (331-495)	854 (723-1040)	1520 (1040-2060)	566
Non-Hispanic blacks (2003 - 2004)	382 (310-471)	357 (287-478)	717 (549-843)	1260 (1050-1600)	1880 (1540-2330)	661
Non-Hispanic blacks (2005 - 2006)	416 (360-481)	406 (366-450)	716 (593-943)	1430 (1010-2250)	2310 (1590-3410)	655
Non-Hispanic blacks (2007 - 2008)	426 (376-482)	423 (356-477)	817 (693-978)	1490 (1200-1950)	2260 (1870-3040)	597
Non-Hispanic blacks (2009 - 2010)	377 (339-419)	363 (339-421)	745 (626-878)	1240 (1110-1460)	2120 (1430-2680)	517
Non-Hispanic whites (2003 - 2004)	265 (225-312)	265 (227-324)	558 (452-660)	939 (826-1130)	1450 (1090-1770)	1038
Non-Hispanic whites (2005 - 2006)	306 (279-335)	296 (257-331)	613 (548-669)	1290 (1150-1450)	1730 (1530-2140)	966
Non-Hispanic whites (2007 - 2008)	345 (302-394)	338 (286-398)	700 (564-849)	1380 (1030-1690)	2040 (1570-2650)	1080
Non-Hispanic whites (2009 - 2010)	252 (232-273)	254 (225-274)	485 (448-544)	934 (833-1060)	1480 (1220-1700)	1203

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 9-Hydroxyfluorene (2011 – 2012)‡

CAS Number 1689-64-1

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	245 (226-265)	244 (226-259)	501 (447-560)	1080 (934-1190)	1550 (1310-1840)	2491
Age 6-11 years (2011 - 2012)	147 (124-176)	140 (119-161)	308 (235-441)	661 (471-845)	1030 (684-1350)	397
Age 12-19 years (2011 - 2012)	210 (176-249)	213 (163-270)	428 (318-576)	796 (619-961)	1010 (856-1340)	388
Age 20+ years (2011 - 2012)	265 (244-287)	257 (236-284)	537 (472-613)	1180 (1040-1310)	1700 (1330-2140)	1706
Males (2011 - 2012)	278 (254-304)	270 (248-296)	566 (481-672)	1150 (978-1310)	1650 (1310-2280)	1258
Females (2011 - 2012)	217 (193-244)	212 (187-243)	438 (386-511)	966 (786-1220)	1440 (1140-1860)	1233
Mexican Americans (2011 - 2012)	204 (155-268)	194 (152-228)	391 (277-508)	853 (528-1620)	1650 (538-14400)	317
Non-Hispanic blacks (2011 - 2012)	356 (311-406)	357 (310-398)	677 (579-847)	1350 (1030-1660)	1940 (1570-2420)	664
Non-Hispanic whites (2011 - 2012)	238 (219-260)	244 (221-262)	492 (436-564)	1070 (886-1190)	1400 (1230-1710)	814
All Hispanics (2011 - 2012)	225 (190-267)	208 (184-239)	455 (373-528)	914 (719-1310)	1560 (940-2090)	572
Asians (2011 - 2012)	168 (135-209)	164 (127-197)	304 (230-427)	762 (469-988)	1200 (790-1820)	352

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 9-Hydroxyfluorene (creatinine corrected) (2003 – 2010)

CAS Number 1689-64-1

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	252 (230-276)	233 (205-266)	412 (371-461)	729 (609-905)	1100 (918-1390)	2504
Total population (2005 - 2006)	301 (281-322)	270 (252-290)	511 (460-575)	1040 (908-1230)	1510 (1360-1750)	2422
Total population (2007 - 2008)	339 (309-372)	303 (277-333)	562 (493-645)	1110 (908-1300)	1660 (1430-1960)	2608
Total population (2009 - 2010)	266 (254-279)	242 (224-262)	442 (417-466)	838 (775-894)	1250 (1160-1360)	2747
Age 6-11 years (2003 - 2004)	223 (200-247)	208 (176-264)	343 (299-389)	548 (433-689)	866 (533-958)	333
Age 6-11 years (2005 - 2006)	205 (180-234)	195 (176-209)	309 (272-371)	590 (402-668)	866 (620-1300)	342
Age 6-11 years (2007 - 2008)	298 (256-346)	280 (249-331)	463 (399-576)	817 (576-1130)	1130 (862-1230)	389
Age 6-11 years (2009 - 2010)	214 (192-237)	185 (169-203)	331 (275-365)	568 (400-848)	1020 (539-1650)	416
Age 12-19 years (2003 - 2004)	192 (172-215)	182 (161-200)	323 (286-360)	484 (412-696)	738 (571-1110)	698
Age 12-19 years (2005 - 2006)	201 (183-220)	194 (173-223)	325 (283-343)	511 (397-666)	848 (521-941)	668
Age 12-19 years (2007 - 2008)	239 (204-280)	235 (190-283)	381 (312-462)	596 (479-722)	768 (660-1090)	401
Age 12-19 years (2009 - 2010)	191 (175-207)	181 (162-199)	293 (257-338)	521 (376-604)	691 (534-938)	420
Age 20+ years (2003 - 2004)	267 (242-294)	243 (219-280)	446 (392-490)	788 (641-994)	1280 (991-1560)	1473
Age 20+ years (2005 - 2006)	336 (314-358)	304 (284-323)	573 (506-650)	1200 (1000-1360)	1720 (1490-1900)	1412
Age 20+ years (2007 - 2008)	363 (330-399)	314 (293-351)	618 (533-738)	1200 (1030-1450)	1770 (1570-2040)	1818
Age 20+ years (2009 - 2010)	287 (272-302)	265 (243-288)	484 (450-514)	909 (832-986)	1340 (1230-1460)	1911
Males (2003 - 2004)	260 (238-283)	236 (209-269)	429 (382-480)	739 (591-952)	1300 (916-1800)	1208
Males (2005 - 2006)	286 (266-308)	258 (235-291)	498 (422-576)	993 (858-1180)	1410 (1240-1730)	1208
Males (2007 - 2008)	338 (308-372)	303 (269-338)	575 (516-626)	1150 (987-1300)	1690 (1420-1940)	1294
Males (2009 - 2010)	257 (240-275)	228 (206-258)	445 (402-489)	816 (747-932)	1260 (1070-1420)	1399
Females (2003 - 2004)	244 (217-275)	227 (198-269)	396 (342-467)	717 (569-905)	1020 (905-1280)	1296
Females (2005 - 2006)	316 (287-348)	278 (253-303)	532 (466-623)	1100 (840-1370)	1610 (1360-1840)	1214
Females (2007 - 2008)	340 (306-377)	303 (274-335)	555 (451-683)	1030 (852-1330)	1620 (1330-2040)	1314
Females (2009 - 2010)	275 (260-291)	256 (229-279)	442 (396-507)	849 (732-950)	1230 (1070-1380)	1348

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 9-Hydroxyfluorene (creatinine corrected) (2003 – 2010)

CAS Number 1689-64-1

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	209 (188-232)	195 (181-209)	335 (293-379)	541 (447-722)	793 (569-1440)	614
Mexican Americans (2005 - 2006)	208 (194-224)	201 (180-220)	304 (270-342)	502 (425-584)	663 (527-919)	614
Mexican Americans (2007 - 2008)	260 (236-285)	244 (226-259)	388 (348-419)	654 (527-858)	1160 (775-1640)	532
Mexican Americans (2009 - 2010)	213 (186-243)	186 (161-214)	312 (285-378)	727 (524-1070)	1410 (1030-2360)	566
Non-Hispanic blacks (2003 - 2004)	271 (225-326)	258 (207-308)	460 (344-562)	777 (630-919)	1040 (856-1300)	661
Non-Hispanic blacks (2005 - 2006)	293 (258-332)	261 (230-297)	449 (377-554)	851 (635-1080)	1480 (925-2070)	655
Non-Hispanic blacks (2007 - 2008)	331 (289-379)	293 (257-333)	542 (489-620)	990 (805-1250)	1550 (1160-2470)	597
Non-Hispanic blacks (2009 - 2010)	273 (256-292)	253 (224-279)	445 (403-489)	793 (626-887)	1170 (887-1540)	517
Non-Hispanic whites (2003 - 2004)	263 (235-294)	243 (211-285)	438 (386-485)	773 (607-1020)	1300 (967-1710)	1038
Non-Hispanic whites (2005 - 2006)	323 (296-353)	293 (266-322)	570 (496-650)	1180 (962-1360)	1630 (1370-1840)	966
Non-Hispanic whites (2007 - 2008)	359 (316-407)	314 (280-366)	605 (497-750)	1170 (935-1420)	1740 (1460-2040)	1080
Non-Hispanic whites (2009 - 2010)	283 (269-298)	261 (239-279)	458 (427-500)	891 (776-1000)	1280 (1170-1420)	1203

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 9-Hydroxyfluorene (creatinine corrected) (2011 – 2012)‡

CAS Number 1689-64-1

Metabolite of Fluorene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	279 (261-298)	248 (229-270)	490 (431-544)	934 (875-1010)	1370 (1140-1660)	2489
Age 6-11 years (2011 - 2012)	212 (183-247)	191 (163-225)	328 (274-365)	544 (413-928)	1000 (688-1450)	396
Age 12-19 years (2011 - 2012)	203 (182-225)	188 (173-207)	323 (273-380)	538 (430-644)	804 (595-876)	388
Age 20+ years (2011 - 2012)	301 (279-325)	271 (244-301)	561 (480-620)	1030 (918-1140)	1480 (1180-2010)	1705
Males (2011 - 2012)	260 (241-281)	226 (205-251)	450 (395-540)	908 (794-1010)	1260 (1000-1650)	1257
Females (2011 - 2012)	297 (269-329)	270 (229-322)	505 (436-581)	984 (914-1100)	1480 (1140-1850)	1232
Mexican Americans (2011 - 2012)	229 (186-283)	187 (162-235)	376 (311-430)	750 (430-1630)	1480 (511-5650)	317
Non-Hispanic blacks (2011 - 2012)	277 (244-314)	256 (231-294)	447 (399-540)	823 (640-1040)	1240 (918-1460)	664
Non-Hispanic whites (2011 - 2012)	290 (268-314)	257 (227-290)	542 (451-614)	961 (875-1080)	1350 (1130-1660)	812
All Hispanics (2011 - 2012)	252 (217-293)	220 (186-267)	415 (343-492)	1000 (520-1330)	1390 (787-3250)	572
Asians (2011 - 2012)	224 (188-268)	200 (166-273)	381 (310-451)	647 (500-865)	914 (697-1430)	352

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Fluorene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxyphenanthrene (2001 – 2010)

CAS Number 2433-56-9

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	140 (125-158)	141 (130-154)	266 (229-312)	476 (426-539)	684 (581-763)	2741
Total population (2003 - 2004)	156 (140-173)	166 (150-179)	287 (263-321)	464 (423-508)	625 (538-745)	2496
Total population (2005 - 2006)	152 (143-161)	151 (138-163)	275 (257-303)	493 (428-549)	669 (580-852)	2449
Total population (2007 - 2008)	139 (130-149)	140 (127-154)	252 (228-272)	442 (402-481)	683 (577-760)	2608
Total population (2009 - 2010)	131 (124-140)	133 (126-141)	235 (222-251)	402 (367-451)	567 (488-659)	2746
Age 6-11 years (2001 - 2002)	119 (104-137)	121 (98.0-142)	228 (182-249)	357 (265-501)	501 (367-661)	387
Age 6-11 years (2003 - 2004)	138 (124-154)	131 (111-161)	222 (200-275)	397 (304-500)	615 (384-916)	328
Age 6-11 years (2005 - 2006)	111 (101-123)	110 (96.9-121)	176 (150-240)	320 (251-375)	381 (329-540)	345
Age 6-11 years (2007 - 2008)	121 (105-139)	120 (96.5-154)	200 (174-235)	334 (247-401)	405 (278-557)	389
Age 6-11 years (2009 - 2010)	103 (90.7-116)	105 (89.0-119)	156 (142-172)	261 (226-320)	363 (283-628)	416
Age 12-19 years (2001 - 2002)	133 (110-162)	131 (110-153)	238 (198-303)	431 (376-546)	579 (439-820)	733
Age 12-19 years (2003 - 2004)	158 (141-178)	171 (138-193)	300 (262-333)	470 (437-537)	654 (563-745)	692
Age 12-19 years (2005 - 2006)	144 (132-157)	154 (130-175)	260 (236-286)	425 (383-496)	666 (496-845)	677
Age 12-19 years (2007 - 2008)	136 (122-152)	144 (128-164)	219 (199-283)	374 (315-415)	503 (392-607)	401
Age 12-19 years (2009 - 2010)	133 (117-151)	124 (106-142)	244 (212-269)	410 (296-510)	511 (414-742)	420
Age 20+ years (2001 - 2002)	145 (127-164)	145 (133-164)	274 (237-329)	499 (440-565)	713 (595-819)	1621
Age 20+ years (2003 - 2004)	157 (141-176)	167 (152-182)	296 (264-337)	469 (430-513)	625 (534-783)	1476
Age 20+ years (2005 - 2006)	159 (147-172)	156 (141-172)	287 (265-328)	516 (438-615)	744 (580-996)	1427
Age 20+ years (2007 - 2008)	142 (132-153)	141 (125-158)	258 (241-280)	470 (417-531)	733 (622-856)	1818
Age 20+ years (2009 - 2010)	135 (126-144)	140 (131-148)	245 (223-265)	412 (377-462)	579 (497-672)	1910
Males (2001 - 2002)	150 (133-169)	145 (132-164)	284 (235-348)	501 (424-593)	713 (575-845)	1344
Males (2003 - 2004)	176 (161-194)	182 (167-198)	321 (283-363)	492 (459-536)	662 (541-929)	1196
Males (2005 - 2006)	169 (156-183)	166 (153-180)	289 (265-334)	519 (438-593)	791 (562-1080)	1222
Males (2007 - 2008)	153 (140-167)	152 (137-171)	268 (251-292)	448 (406-488)	722 (566-813)	1294
Males (2009 - 2010)	139 (129-149)	140 (127-153)	244 (222-260)	399 (363-457)	565 (469-664)	1398
Females (2001 - 2002)	132 (115-152)	137 (121-151)	254 (221-297)	464 (390-520)	654 (538-769)	1397
Females (2003 - 2004)	138 (122-156)	144 (126-164)	263 (240-294)	430 (404-469)	589 (489-680)	1300
Females (2005 - 2006)	137 (123-152)	136 (117-153)	260 (234-297)	460 (391-553)	648 (540-809)	1227
Females (2007 - 2008)	128 (120-136)	128 (117-139)	230 (205-258)	432 (373-500)	663 (527-740)	1314
Females (2009 - 2010)	125 (116-135)	129 (119-136)	231 (214-246)	405 (332-489)	581 (470-689)	1348

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 3.5, 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxyphenanthrene (2001 – 2010)

CAS Number 2433-56-9

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	117 (90.8-152)	116 (88.0-147)	214 (157-306)	369 (254-583)	549 (342-847)	664
Mexican Americans (2003 - 2004)	138 (120-158)	152 (129-175)	246 (213-291)	413 (311-492)	518 (352-896)	611
Mexican Americans (2005 - 2006)	125 (104-151)	129 (107-151)	223 (174-276)	376 (298-460)	523 (399-617)	621
Mexican Americans (2007 - 2008)	118 (108-129)	108 (103-119)	194 (172-216)	341 (271-437)	491 (417-738)	532
Mexican Americans (2009 - 2010)	116 (107-126)	112 (100-126)	195 (168-245)	391 (294-509)	603 (432-825)	565
Non-Hispanic blacks (2001 - 2002)	150 (127-179)	145 (126-170)	287 (243-327)	493 (423-629)	713 (568-975)	690
Non-Hispanic blacks (2003 - 2004)	183 (152-219)	178 (148-213)	350 (268-423)	551 (455-645)	797 (588-1050)	661
Non-Hispanic blacks (2005 - 2006)	162 (148-177)	155 (141-173)	307 (259-349)	517 (408-695)	753 (545-1110)	658
Non-Hispanic blacks (2007 - 2008)	142 (129-158)	141 (128-163)	264 (234-302)	448 (401-511)	613 (522-722)	597
Non-Hispanic blacks (2009 - 2010)	148 (130-167)	161 (135-181)	269 (234-312)	410 (346-489)	536 (435-658)	517
Non-Hispanic whites (2001 - 2002)	144 (125-166)	144 (131-162)	276 (241-330)	489 (436-552)	661 (550-793)	1204
Non-Hispanic whites (2003 - 2004)	159 (140-180)	167 (151-185)	296 (267-330)	474 (421-534)	641 (516-843)	1036
Non-Hispanic whites (2005 - 2006)	156 (143-170)	155 (137-173)	279 (251-322)	500 (414-606)	743 (570-1050)	982
Non-Hispanic whites (2007 - 2008)	146 (133-159)	149 (132-174)	261 (235-292)	453 (405-503)	725 (590-836)	1080
Non-Hispanic whites (2009 - 2010)	133 (123-144)	136 (128-143)	235 (214-259)	409 (357-462)	570 (470-689)	1203

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 3.5, 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxyphenanthrene (2011 – 2014)

CAS Number 2433-56-9

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	126 (117-135)	126 (115-134)	240 (219-254)	426 (365-463)	565 (493-682)	2492
Total population (2013 - 2014)	93.0 (87.9-98.4)	92.0 (86.0-100)	173 (159-188)	296 (270-323)	426 (374-490)	2650
Age 6-11 years (2011 - 2012)	98.6 (87.8-111)	100 (89.0-115)	199 (144-240)	323 (270-405)	473 (327-549)	397
Age 6-11 years (2013 - 2014)	68.2 (59.9-77.7)	68.0 (58.0-77.0)	125 (107-151)	208 (166-277)	302 (219-449)	399
Age 12-19 years (2011 - 2012)	119 (103-138)	132 (108-157)	219 (192-252)	332 (284-365)	438 (344-505)	389
Age 12-19 years (2013 - 2014)	92.9 (78.1-110)	99.0 (77.0-132)	179 (147-211)	291 (243-356)	381 (320-422)	449
Age 20+ years (2011 - 2012)	130 (121-140)	128 (119-138)	248 (221-270)	450 (372-499)	589 (495-759)	1706
Age 20+ years (2013 - 2014)	96.1 (90.6-102)	94.0 (87.0-103)	179 (160-196)	311 (272-344)	454 (377-533)	1802
Males (2011 - 2012)	133 (121-146)	132 (115-149)	246 (221-271)	434 (365-476)	589 (466-781)	1258
Males (2013 - 2014)	97.5 (91.3-104)	96.0 (88.0-105)	175 (154-204)	298 (264-339)	440 (361-545)	1315
Females (2011 - 2012)	119 (109-131)	117 (107-128)	232 (212-249)	408 (334-471)	557 (465-682)	1234
Females (2013 - 2014)	88.8 (82.6-95.5)	91.0 (78.0-100)	171 (161-182)	296 (257-347)	395 (354-488)	1335
Mexican Americans (2011 - 2012)	115 (91.3-146)	112 (94.0-131)	214 (156-260)	371 (260-572)	572 (284-1390)	317
Mexican Americans (2013 - 2014)	80.2 (73.9-86.9)	82.0 (75.0-91.0)	136 (124-155)	239 (178-274)	293 (253-361)	450
Non-Hispanic blacks (2011 - 2012)	141 (129-155)	140 (129-156)	244 (221-268)	439 (366-503)	609 (495-849)	664
Non-Hispanic blacks (2013 - 2014)	118 (104-135)	116 (98.0-137)	215 (182-241)	366 (285-412)	480 (372-589)	578
Non-Hispanic whites (2011 - 2012)	126 (117-136)	128 (114-141)	245 (219-261)	428 (352-475)	557 (456-733)	814
Non-Hispanic whites (2013 - 2014)	94.0 (87.2-101)	94.0 (83.0-103)	179 (159-196)	317 (272-360)	475 (384-550)	979
All Hispanics (2011 - 2012)	125 (108-146)	123 (105-138)	239 (207-260)	391 (321-502)	544 (439-826)	573
All Hispanics (2013 - 2014)	84.7 (77.5-92.7)	86.0 (75.0-99.0)	146 (131-169)	245 (208-286)	310 (275-349)	698
Asians (2011 - 2012)	91.3 (75.3-111)	88.0 (65.0-114)	173 (134-238)	303 (260-387)	447 (315-597)	352
Asians (2013 - 2014)	59.8 (48.9-73.2)	62.0 (50.0-69.0)	105 (81.0-130)	178 (118-296)	274 (155-403)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 10.0 and 9.0, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxyphenanthrene (creatinine corrected) (2001 – 2010)

CAS Number 2433-56-9

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	132 (118-147)	125 (113-141)	210 (191-231)	344 (310-385)	464 (404-539)	2741
Total population (2003 - 2004)	146 (138-155)	141 (133-150)	222 (205-244)	352 (330-384)	487 (416-546)	2496
Total population (2005 - 2006)	147 (138-157)	140 (130-148)	229 (211-247)	372 (339-406)	502 (446-600)	2449
Total population (2007 - 2008)	140 (130-151)	137 (124-151)	221 (207-236)	345 (319-372)	457 (407-522)	2608
Total population (2009 - 2010)	137 (132-143)	130 (125-136)	206 (194-221)	328 (304-346)	448 (395-489)	2746
Age 6-11 years (2001 - 2002)	133 (116-153)	126 (110-147)	188 (165-225)	344 (245-437)	467 (364-598)	387
Age 6-11 years (2003 - 2004)	145 (129-163)	138 (121-155)	205 (169-240)	315 (244-456)	477 (313-803)	328
Age 6-11 years (2005 - 2006)	124 (114-134)	115 (103-133)	191 (162-210)	275 (230-340)	368 (321-396)	345
Age 6-11 years (2007 - 2008)	149 (132-169)	139 (127-158)	221 (191-264)	334 (275-410)	424 (332-796)	389
Age 6-11 years (2009 - 2010)	134 (121-148)	122 (113-133)	184 (161-209)	290 (241-437)	489 (290-845)	416
Age 12-19 years (2001 - 2002)	103 (87.9-121)	97.3 (81.4-117)	158 (131-192)	240 (198-322)	354 (235-531)	733
Age 12-19 years (2003 - 2004)	119 (108-130)	115 (101-131)	176 (157-197)	275 (230-331)	345 (269-496)	692
Age 12-19 years (2005 - 2006)	108 (97.5-119)	108 (95.9-116)	163 (148-180)	268 (199-330)	372 (262-609)	677
Age 12-19 years (2007 - 2008)	106 (94.9-117)	106 (90.0-116)	158 (147-171)	243 (197-303)	324 (250-407)	401
Age 12-19 years (2009 - 2010)	107 (99.6-115)	102 (94.4-112)	150 (130-164)	227 (190-273)	316 (228-491)	420
Age 20+ years (2001 - 2002)	137 (122-153)	132 (117-145)	223 (200-243)	351 (319-395)	476 (421-541)	1621
Age 20+ years (2003 - 2004)	151 (142-161)	147 (134-157)	237 (212-253)	365 (335-397)	500 (422-580)	1476
Age 20+ years (2005 - 2006)	158 (147-170)	151 (137-163)	244 (224-265)	397 (362-420)	554 (478-666)	1427
Age 20+ years (2007 - 2008)	145 (135-157)	142 (127-156)	229 (214-251)	354 (336-383)	495 (420-560)	1818
Age 20+ years (2009 - 2010)	143 (137-149)	139 (132-144)	221 (203-235)	333 (316-356)	455 (407-500)	1910
Males (2001 - 2002)	122 (108-137)	116 (104-131)	194 (173-218)	321 (262-395)	455 (348-642)	1344
Males (2003 - 2004)	138 (131-146)	130 (117-143)	201 (187-227)	335 (301-391)	437 (392-550)	1196
Males (2005 - 2006)	135 (126-145)	125 (117-132)	208 (187-229)	341 (300-385)	498 (391-634)	1222
Males (2007 - 2008)	129 (117-141)	126 (112-141)	207 (191-223)	327 (290-344)	410 (354-487)	1294
Males (2009 - 2010)	125 (117-132)	118 (109-130)	188 (176-206)	288 (266-324)	397 (332-500)	1398
Females (2001 - 2002)	142 (125-160)	136 (118-156)	226 (199-256)	355 (323-399)	473 (421-541)	1397
Females (2003 - 2004)	154 (142-168)	150 (138-160)	241 (212-269)	364 (323-425)	505 (418-635)	1300
Females (2005 - 2006)	160 (149-172)	152 (136-166)	251 (229-275)	398 (367-428)	509 (435-638)	1227
Females (2007 - 2008)	152 (140-165)	148 (133-162)	231 (213-262)	373 (329-411)	478 (409-577)	1314
Females (2009 - 2010)	151 (143-159)	142 (133-151)	226 (196-245)	350 (321-387)	468 (395-553)	1348

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxyphenanthrene (creatinine corrected) (2001 – 2010)

CAS Number 2433-56-9

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	110 (88.6-136)	101 (85.5-131)	162 (138-203)	275 (187-452)	400 (268-755)	664
Mexican Americans (2003 - 2004)	124 (111-140)	122 (107-136)	183 (159-242)	304 (246-392)	392 (318-437)	611
Mexican Americans (2005 - 2006)	112 (99.2-126)	109 (87.1-129)	170 (145-201)	259 (228-307)	353 (297-414)	621
Mexican Americans (2007 - 2008)	115 (102-129)	107 (96.7-118)	159 (143-183)	287 (218-344)	424 (324-520)	532
Mexican Americans (2009 - 2010)	116 (104-129)	104 (93.1-114)	163 (141-203)	312 (225-471)	502 (329-860)	565
Non-Hispanic blacks (2001 - 2002)	106 (88.7-127)	102 (92.4-111)	172 (141-203)	274 (224-356)	384 (308-598)	690
Non-Hispanic blacks (2003 - 2004)	129 (112-148)	125 (107-143)	199 (173-239)	337 (279-395)	428 (374-536)	661
Non-Hispanic blacks (2005 - 2006)	114 (106-121)	107 (98.6-114)	179 (163-189)	301 (229-370)	449 (321-771)	658
Non-Hispanic blacks (2007 - 2008)	111 (98.8-124)	109 (90.0-126)	181 (153-201)	293 (257-338)	385 (338-446)	597
Non-Hispanic blacks (2009 - 2010)	107 (102-113)	98.5 (94.1-108)	165 (149-179)	258 (240-283)	328 (283-386)	517
Non-Hispanic whites (2001 - 2002)	142 (126-161)	137 (119-153)	228 (206-247)	363 (321-406)	476 (411-552)	1204
Non-Hispanic whites (2003 - 2004)	156 (146-168)	149 (138-158)	239 (214-255)	373 (335-426)	515 (426-649)	1036
Non-Hispanic whites (2005 - 2006)	164 (152-176)	154 (141-165)	247 (228-268)	398 (366-428)	554 (466-739)	982
Non-Hispanic whites (2007 - 2008)	152 (139-166)	152 (135-167)	236 (217-258)	354 (330-383)	464 (407-551)	1080
Non-Hispanic whites (2009 - 2010)	150 (143-157)	143 (135-152)	225 (204-240)	332 (310-365)	451 (378-528)	1203

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxyphenanthrene (creatinine corrected) (2011 – 2014)

CAS Number 2433-56-9

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	143 (134-153)	134 (126-143)	218 (200-247)	357 (320-410)	519 (473-554)	2490
Total population (2013 - 2014)	108 (103-113)	104 (97.1-110)	164 (157-170)	260 (242-273)	355 (320-379)	2649
Age 6-11 years (2011 - 2012)	142 (131-155)	137 (123-150)	206 (175-217)	292 (255-363)	450 (272-678)	396
Age 6-11 years (2013 - 2014)	102 (91.2-115)	102 (87.1-122)	136 (127-164)	225 (185-267)	302 (252-336)	399
Age 12-19 years (2011 - 2012)	115 (101-132)	117 (87.0-144)	172 (153-213)	254 (215-303)	310 (254-359)	389
Age 12-19 years (2013 - 2014)	84.2 (79.0-89.7)	85.7 (76.1-93.0)	127 (111-139)	179 (153-214)	226 (189-320)	449
Age 20+ years (2011 - 2012)	148 (138-159)	137 (128-146)	232 (206-260)	377 (337-459)	543 (500-583)	1705
Age 20+ years (2013 - 2014)	113 (108-118)	108 (103-115)	171 (164-184)	268 (255-286)	364 (336-389)	1801
Males (2011 - 2012)	125 (118-132)	117 (107-124)	188 (172-207)	297 (272-360)	437 (364-522)	1257
Males (2013 - 2014)	97.8 (92.4-104)	94.1 (88.6-101)	148 (139-157)	235 (212-250)	289 (264-346)	1314
Females (2011 - 2012)	163 (148-180)	152 (138-175)	250 (217-281)	406 (340-494)	549 (500-664)	1233
Females (2013 - 2014)	119 (112-126)	116 (106-123)	182 (168-196)	286 (256-316)	387 (323-482)	1335
Mexican Americans (2011 - 2012)	130 (111-152)	117 (102-133)	191 (148-235)	373 (231-676)	497 (337-837)	317
Mexican Americans (2013 - 2014)	91.9 (84.5-99.9)	90.1 (77.4-102)	139 (126-156)	225 (179-258)	265 (236-318)	450
Non-Hispanic blacks (2011 - 2012)	110 (100-121)	110 (96.1-122)	168 (147-197)	273 (238-319)	387 (322-453)	664
Non-Hispanic blacks (2013 - 2014)	90.2 (81.0-100)	92.4 (78.8-105)	141 (122-170)	216 (189-253)	280 (251-358)	578
Non-Hispanic whites (2011 - 2012)	154 (143-165)	143 (133-154)	234 (207-265)	368 (335-450)	543 (478-593)	812
Non-Hispanic whites (2013 - 2014)	116 (111-123)	112 (103-118)	170 (163-187)	281 (261-303)	379 (325-467)	978
All Hispanics (2011 - 2012)	140 (125-157)	128 (117-141)	214 (184-244)	357 (274-481)	504 (383-792)	573
All Hispanics (2013 - 2014)	94.8 (87.4-103)	93.0 (81.7-102)	140 (128-159)	226 (203-246)	265 (246-318)	698
Asians (2011 - 2012)	122 (106-141)	119 (100-136)	191 (165-222)	286 (260-341)	429 (336-571)	352
Asians (2013 - 2014)	93.8 (78.4-112)	90.0 (75.9-115)	151 (124-184)	226 (176-298)	298 (226-376)	291

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyphenanthrene (2001 – 2010)

CAS Number 605-55-0

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	54.0 (46.0-63.5)	58.0 (50.0-68.0)	117 (102-140)	240 (201-271)	332 (299-377)	2742
Total population (2003 - 2004)	59.3 (52.5-66.9)	62.2 (55.4-69.7)	117 (105-129)	206 (180-235)	291 (252-336)	2512
Total population (2005 - 2006)	65.3 (60.9-70.0)	63.3 (58.5-68.6)	126 (111-139)	234 (203-254)	314 (282-383)	2410
Total population (2007 - 2008)	63.6 (58.8-68.7)	62.9 (58.0-68.7)	117 (104-130)	204 (184-223)	300 (256-367)	2572
Total population (2009 - 2010)	64.1 (60.3-68.0)	64.0 (58.0-69.0)	114 (108-122)	204 (185-228)	281 (260-310)	2744
Age 6-11 years (2001 - 2002)	40.5 (34.3-47.7)	46.0 (37.0-57.0)	87.0 (71.0-101)	170 (133-207)	257 (195-320)	387
Age 6-11 years (2003 - 2004)	45.3 (40.0-51.3)	48.1 (41.9-56.8)	72.7 (63.2-89.4)	135 (104-176)	225 (136-299)	337
Age 6-11 years (2005 - 2006)	42.1 (38.4-46.1)	40.1 (36.4-47.2)	70.4 (58.1-83.2)	110 (89.2-132)	152 (112-213)	341
Age 6-11 years (2007 - 2008)	48.1 (41.8-55.4)	46.4 (41.7-54.6)	80.3 (68.2-95.4)	144 (98.8-184)	184 (122-229)	382
Age 6-11 years (2009 - 2010)	44.6 (39.3-50.7)	44.0 (39.0-51.0)	71.0 (60.0-80.0)	112 (89.0-131)	167 (112-260)	416
Age 12-19 years (2001 - 2002)	49.5 (37.3-65.7)	52.0 (41.0-68.0)	108 (93.0-122)	210 (145-270)	281 (214-524)	733
Age 12-19 years (2003 - 2004)	58.0 (50.7-66.2)	62.5 (54.5-71.6)	104 (88.8-132)	198 (166-215)	258 (199-318)	707
Age 12-19 years (2005 - 2006)	60.4 (55.4-65.8)	62.4 (56.3-67.1)	114 (93.8-133)	175 (156-195)	250 (198-291)	664
Age 12-19 years (2007 - 2008)	59.4 (52.9-66.7)	60.5 (51.5-67.0)	97.4 (81.2-121)	160 (133-204)	223 (175-264)	398
Age 12-19 years (2009 - 2010)	60.6 (53.0-69.3)	62.0 (51.0-68.0)	109 (90.0-126)	170 (130-230)	230 (155-443)	420
Age 20+ years (2001 - 2002)	56.8 (48.1-66.9)	60.0 (52.0-73.0)	126 (104-152)	249 (207-292)	342 (308-398)	1622
Age 20+ years (2003 - 2004)	61.5 (53.7-70.4)	64.9 (57.2-73.5)	125 (111-138)	216 (187-250)	310 (259-389)	1468
Age 20+ years (2005 - 2006)	69.6 (63.6-76.2)	67.3 (61.5-75.3)	137 (118-154)	251 (215-280)	348 (298-446)	1405
Age 20+ years (2007 - 2008)	66.2 (60.8-72.1)	65.9 (60.4-71.2)	123 (109-136)	218 (195-251)	334 (272-412)	1792
Age 20+ years (2009 - 2010)	67.3 (63.1-71.8)	68.0 (61.0-75.0)	120 (114-127)	218 (199-244)	296 (266-324)	1908
Males (2001 - 2002)	62.1 (53.3-72.5)	67.0 (58.0-80.0)	136 (109-161)	274 (245-303)	367 (329-414)	1345
Males (2003 - 2004)	72.3 (64.4-81.3)	71.6 (65.8-83.3)	138 (123-150)	240 (200-279)	337 (279-428)	1211
Males (2005 - 2006)	76.5 (70.3-83.3)	72.9 (67.4-81.3)	141 (122-156)	254 (219-296)	383 (289-555)	1204
Males (2007 - 2008)	75.8 (70.3-81.8)	73.5 (67.6-81.4)	136 (126-149)	229 (199-256)	354 (276-408)	1277
Males (2009 - 2010)	72.1 (66.6-78.1)	72.0 (62.0-79.0)	124 (112-139)	227 (198-253)	310 (271-357)	1397
Females (2001 - 2002)	47.4 (39.1-57.5)	50.0 (41.0-60.0)	105 (88.0-129)	200 (171-240)	294 (236-357)	1397
Females (2003 - 2004)	49.0 (42.4-56.6)	52.5 (45.3-58.7)	95.4 (84.1-110)	166 (146-202)	247 (202-291)	1301
Females (2005 - 2006)	56.0 (50.2-62.5)	54.4 (49.5-61.0)	107 (94.7-125)	206 (173-245)	275 (248-343)	1206
Females (2007 - 2008)	53.7 (48.9-59.0)	53.0 (48.9-59.2)	97.0 (87.0-111)	173 (146-207)	280 (206-327)	1295
Females (2009 - 2010)	57.2 (53.2-61.4)	57.0 (52.0-64.0)	108 (98.0-114)	189 (161-214)	253 (214-301)	1347

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 3.2, 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyphenanthrene (2001 – 2010)

CAS Number 605-55-0

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	46.8 (32.7-66.8)	51.0 (36.0-73.0)	97.0 (72.0-140)	191 (122-332)	303 (187-652)	665
Mexican Americans (2003 - 2004)	53.9 (46.7-62.1)	60.1 (50.8-68.6)	104 (89.5-115)	164 (144-187)	200 (187-219)	627
Mexican Americans (2005 - 2006)	54.6 (45.0-66.3)	56.2 (47.1-67.7)	96.2 (84.4-108)	164 (120-202)	213 (175-294)	612
Mexican Americans (2007 - 2008)	58.2 (53.9-62.7)	59.3 (50.8-63.0)	98.6 (92.5-113)	167 (141-193)	252 (192-395)	528
Mexican Americans (2009 - 2010)	57.6 (51.3-64.8)	56.0 (45.0-64.0)	95.0 (80.0-116)	190 (153-234)	303 (228-479)	566
Non-Hispanic blacks (2001 - 2002)	71.1 (58.0-87.1)	74.0 (66.0-90.0)	152 (124-182)	262 (217-311)	374 (284-560)	690
Non-Hispanic blacks (2003 - 2004)	81.9 (68.2-98.3)	74.1 (61.0-102)	164 (125-199)	282 (217-375)	390 (289-574)	660
Non-Hispanic blacks (2005 - 2006)	77.3 (69.0-86.6)	75.3 (65.8-83.5)	141 (114-172)	267 (202-340)	363 (275-546)	641
Non-Hispanic blacks (2007 - 2008)	72.8 (65.2-81.3)	70.7 (62.6-80.2)	127 (115-149)	251 (206-284)	367 (284-455)	597
Non-Hispanic blacks (2009 - 2010)	80.1 (71.2-90.0)	86.0 (77.0-98.0)	139 (123-164)	224 (190-265)	295 (252-367)	517
Non-Hispanic whites (2001 - 2002)	53.1 (43.6-64.6)	57.0 (48.0-68.0)	117 (99.0-144)	242 (199-286)	333 (303-385)	1204
Non-Hispanic whites (2003 - 2004)	58.1 (49.9-67.6)	60.5 (52.1-71.0)	115 (97.9-133)	209 (172-259)	299 (251-358)	1034
Non-Hispanic whites (2005 - 2006)	65.2 (59.4-71.5)	63.7 (57.0-70.4)	130 (109-144)	244 (206-261)	343 (282-439)	974
Non-Hispanic whites (2007 - 2008)	63.3 (56.6-70.8)	64.0 (56.4-71.1)	121 (102-135)	203 (174-234)	298 (238-410)	1050
Non-Hispanic whites (2009 - 2010)	62.9 (57.5-68.7)	63.0 (55.0-69.0)	112 (101-121)	200 (165-242)	279 (242-310)	1200

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 3.2, 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyphenanthrene (2011 – 2012)†

CAS Number 605-55-0

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	60.8 (56.8-65.2)	60.0 (56.0-65.0)	113 (105-123)	214 (187-242)	288 (263-317)	2489
Age 6-11 years (2011 - 2012)	39.6 (34.3-45.6)	39.0 (33.0-46.0)	78.0 (61.0-96.0)	133 (109-153)	173 (133-237)	397
Age 12-19 years (2011 - 2012)	56.5 (49.8-64.1)	62.0 (53.0-70.0)	105 (88.0-114)	162 (134-183)	212 (169-248)	389
Age 20+ years (2011 - 2012)	64.5 (60.0-69.4)	64.0 (57.0-68.0)	121 (107-132)	233 (198-263)	311 (271-340)	1703
Males (2011 - 2012)	70.3 (63.9-77.4)	69.0 (63.0-77.0)	130 (115-143)	246 (198-288)	339 (277-384)	1257
Females (2011 - 2012)	53.0 (48.7-57.5)	52.0 (50.0-56.0)	100 (89.0-109)	184 (158-210)	259 (216-282)	1232
Mexican Americans (2011 - 2012)	56.3 (43.9-72.1)	56.0 (46.0-69.0)	97.0 (79.0-140)	180 (128-276)	276 (175-508)	317
Non-Hispanic blacks (2011 - 2012)	78.9 (72.3-86.2)	75.0 (68.0-81.0)	145 (122-166)	246 (212-297)	368 (286-436)	663
Non-Hispanic whites (2011 - 2012)	58.3 (54.7-62.2)	58.0 (53.0-64.0)	109 (100-121)	204 (169-243)	282 (247-312)	812
All Hispanics (2011 - 2012)	62.2 (52.7-73.4)	62.0 (53.0-75.0)	112 (99.0-134)	202 (175-248)	268 (214-416)	573
Asians (2011 - 2012)	50.3 (40.5-62.4)	50.0 (39.0-58.0)	96.0 (78.0-118)	187 (126-240)	257 (193-338)	352

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

†Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyphenanthrene (creatinine corrected) (2001 – 2010)

CAS Number 605-55-0

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	50.6 (43.3-59.2)	52.5 (46.4-59.6)	91.4 (78.7-108)	164 (138-200)	233 (206-275)	2742
Total population (2003 - 2004)	55.4 (51.1-60.0)	52.3 (48.8-55.8)	85.8 (79.4-97.0)	150 (128-174)	212 (180-252)	2512
Total population (2005 - 2006)	63.1 (58.9-67.5)	57.0 (53.3-61.9)	101 (92.8-110)	178 (157-194)	245 (209-295)	2410
Total population (2007 - 2008)	64.0 (58.9-69.4)	60.3 (55.3-66.5)	98.2 (87.5-108)	163 (151-179)	229 (199-248)	2572
Total population (2009 - 2010)	66.9 (64.5-69.3)	62.2 (58.9-65.2)	97.7 (94.7-103)	166 (155-176)	228 (212-251)	2744
Age 6-11 years (2001 - 2002)	45.3 (38.8-52.8)	50.0 (40.0-57.8)	85.9 (69.6-100)	144 (105-217)	234 (138-397)	387
Age 6-11 years (2003 - 2004)	47.9 (43.6-52.7)	46.6 (41.0-51.4)	66.3 (60.3-72.8)	106 (81.0-125)	183 (108-295)	337
Age 6-11 years (2005 - 2006)	45.9 (42.0-50.1)	43.6 (38.4-48.7)	65.8 (56.1-85.2)	101 (85.4-110)	116 (101-135)	341
Age 6-11 years (2007 - 2008)	59.7 (51.2-69.4)	56.5 (49.4-65.2)	85.1 (73.1-107)	134 (105-187)	187 (121-437)	382
Age 6-11 years (2009 - 2010)	58.2 (52.3-64.9)	54.7 (49.3-60.5)	76.6 (69.6-93.8)	124 (104-145)	170 (134-320)	416
Age 12-19 years (2001 - 2002)	38.4 (29.6-49.7)	38.5 (30.6-48.7)	64.9 (52.4-84.0)	117 (86.7-167)	173 (128-305)	733
Age 12-19 years (2003 - 2004)	43.6 (39.3-48.5)	40.8 (37.7-45.0)	70.6 (55.8-84.7)	106 (88.2-123)	127 (115-176)	707
Age 12-19 years (2005 - 2006)	44.5 (39.9-49.7)	42.7 (38.9-47.1)	66.1 (58.0-73.7)	111 (80.0-129)	146 (115-232)	664
Age 12-19 years (2007 - 2008)	46.1 (42.0-50.5)	47.0 (39.7-53.0)	69.7 (62.0-78.0)	100 (83.0-113)	127 (105-188)	398
Age 12-19 years (2009 - 2010)	48.7 (45.1-52.6)	46.5 (43.0-50.8)	67.8 (59.2-73.3)	97.0 (77.3-137)	140 (103-186)	420
Age 20+ years (2001 - 2002)	53.7 (46.2-62.4)	55.6 (49.4-62.7)	94.6 (84.1-112)	173 (145-201)	241 (209-287)	1622
Age 20+ years (2003 - 2004)	58.7 (53.6-64.2)	54.8 (50.7-60.9)	91.6 (83.5-105)	164 (139-182)	227 (183-291)	1468
Age 20+ years (2005 - 2006)	69.1 (64.1-74.6)	63.6 (58.4-67.8)	111 (102-123)	191 (168-216)	267 (232-316)	1405
Age 20+ years (2007 - 2008)	67.8 (62.4-73.8)	64.1 (57.6-71.6)	105 (95.5-119)	177 (160-194)	239 (211-255)	1792
Age 20+ years (2009 - 2010)	71.2 (68.4-74.2)	66.2 (61.9-72.5)	107 (101-113)	177 (164-195)	237 (220-258)	1908
Males (2001 - 2002)	50.4 (43.3-58.5)	52.5 (47.2-59.2)	91.4 (78.6-103)	176 (140-208)	245 (206-349)	1345
Males (2003 - 2004)	56.6 (52.5-61.0)	52.3 (48.1-57.1)	84.7 (79.2-96.4)	157 (132-180)	227 (184-284)	1211
Males (2005 - 2006)	61.2 (56.7-65.9)	55.7 (50.0-59.3)	102 (89.3-111)	161 (137-194)	244 (190-310)	1204
Males (2007 - 2008)	64.0 (59.3-69.1)	59.8 (55.3-64.1)	99.7 (90.5-108)	172 (152-191)	229 (211-243)	1277
Males (2009 - 2010)	64.7 (61.1-68.6)	60.8 (55.1-66.7)	97.7 (89.1-111)	162 (150-179)	229 (202-251)	1397
Females (2001 - 2002)	50.9 (42.7-60.7)	52.8 (45.5-61.0)	91.6 (75.0-115)	158 (133-183)	214 (200-245)	1397
Females (2003 - 2004)	54.3 (48.7-60.5)	52.3 (47.0-57.2)	88.1 (76.4-101)	146 (118-179)	202 (175-246)	1301
Females (2005 - 2006)	65.0 (60.0-70.3)	60.5 (55.1-65.3)	101 (91.6-113)	184 (165-201)	256 (224-312)	1206
Females (2007 - 2008)	63.9 (57.8-70.7)	61.5 (54.0-69.3)	95.8 (83.7-115)	159 (140-189)	229 (186-256)	1295
Females (2009 - 2010)	68.9 (65.8-72.2)	62.9 (59.0-66.9)	97.6 (91.5-106)	168 (150-189)	224 (203-260)	1347

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyphenanthrene (creatinine corrected) (2001 – 2010)

CAS Number 605-55-0

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	43.7 (31.9-59.8)	44.0 (34.3-58.8)	80.8 (59.8-115)	146 (103-245)	245 (144-394)	665
Mexican Americans (2003 - 2004)	48.8 (42.5-55.9)	50.1 (42.4-58.8)	79.5 (68.1-86.1)	124 (96.2-149)	155 (127-206)	627
Mexican Americans (2005 - 2006)	48.7 (43.0-55.2)	46.0 (39.4-56.2)	75.1 (62.9-85.8)	111 (94.5-138)	146 (121-178)	612
Mexican Americans (2007 - 2008)	56.7 (51.1-62.8)	55.0 (47.7-62.2)	83.7 (76.2-90.4)	133 (107-180)	198 (145-233)	528
Mexican Americans (2009 - 2010)	57.2 (50.0-65.4)	49.7 (45.0-55.8)	80.0 (65.2-103)	162 (118-212)	282 (195-402)	566
Non-Hispanic blacks (2001 - 2002)	50.2 (40.5-62.2)	49.7 (44.3-56.0)	87.7 (72.6-103)	174 (127-224)	257 (178-459)	690
Non-Hispanic blacks (2003 - 2004)	57.7 (49.7-67.1)	53.1 (45.7-63.5)	90.2 (77.6-116)	165 (131-189)	224 (173-357)	660
Non-Hispanic blacks (2005 - 2006)	54.3 (49.7-59.3)	47.7 (45.4-51.3)	84.8 (71.3-97.8)	150 (116-192)	211 (167-298)	641
Non-Hispanic blacks (2007 - 2008)	56.6 (50.4-63.6)	51.2 (46.6-55.9)	95.5 (77.7-107)	154 (136-178)	212 (188-232)	597
Non-Hispanic blacks (2009 - 2010)	58.1 (54.5-61.9)	55.7 (51.4-59.7)	87.6 (80.8-96.5)	150 (135-164)	191 (164-210)	517
Non-Hispanic whites (2001 - 2002)	52.5 (43.8-62.9)	54.8 (47.7-61.9)	92.7 (80.5-113)	170 (140-204)	233 (202-293)	1204
Non-Hispanic whites (2003 - 2004)	57.0 (51.6-62.9)	52.7 (48.7-57.0)	88.5 (79.0-102)	159 (126-187)	239 (180-296)	1034
Non-Hispanic whites (2005 - 2006)	67.9 (62.6-73.7)	60.9 (56.5-66.5)	111 (101-123)	191 (162-224)	274 (231-323)	974
Non-Hispanic whites (2007 - 2008)	65.9 (59.4-73.3)	62.8 (55.1-72.0)	100 (87.2-119)	166 (147-190)	229 (197-252)	1050
Non-Hispanic whites (2009 - 2010)	70.7 (67.2-74.3)	65.4 (61.0-72.0)	104 (95.2-112)	166 (154-186)	228 (212-252)	1200

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxyphenanthrene (creatinine corrected) (2011 – 2012)‡

CAS Number 605-55-0

National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	69.2 (65.5-73.1)	62.2 (59.1-66.9)	106 (97.4-116)	182 (167-202)	248 (218-293)	2487
Age 6-11 years (2011 - 2012)	56.8 (50.8-63.6)	54.7 (48.8-60.0)	78.9 (68.8-95.3)	121 (105-148)	180 (131-200)	396
Age 12-19 years (2011 - 2012)	54.6 (49.9-59.6)	52.4 (44.9-64.0)	81.4 (70.8-92.6)	112 (103-147)	163 (121-203)	389
Age 20+ years (2011 - 2012)	73.3 (69.2-77.7)	65.3 (60.9-70.0)	116 (105-127)	200 (178-215)	280 (221-336)	1702
Males (2011 - 2012)	65.9 (61.8-70.3)	58.2 (54.6-61.2)	104 (96.9-113)	181 (159-202)	248 (192-385)	1256
Females (2011 - 2012)	72.5 (66.9-78.6)	67.9 (62.7-73.4)	108 (94.7-125)	187 (165-206)	248 (213-293)	1231
Mexican Americans (2011 - 2012)	63.3 (53.1-75.4)	55.2 (47.3-66.7)	93.2 (78.0-108)	173 (116-237)	243 (166-600)	317
Non-Hispanic blacks (2011 - 2012)	61.4 (56.1-67.1)	59.2 (52.6-65.4)	90.8 (84.4-98.9)	162 (124-192)	227 (187-272)	663
Non-Hispanic whites (2011 - 2012)	70.9 (67.0-74.9)	64.0 (59.3-68.8)	110 (101-120)	187 (167-203)	248 (206-293)	810
All Hispanics (2011 - 2012)	69.6 (61.1-79.3)	61.2 (53.1-70.4)	104 (91.3-123)	180 (144-237)	256 (202-455)	573
Asians (2011 - 2012)	67.4 (56.5-80.3)	65.2 (50.0-82.4)	105 (88.6-130)	162 (140-200)	231 (171-313)	352

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyphenanthrene (2001 – 2010)

CAS Number 605-87-8

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	105 (92.5-118)	105 (92.0-118)	200 (179-225)	401 (336-480)	649 (542-747)	2741
Total population (2003 - 2004)	115 (104-128)	118 (107-129)	219 (201-237)	424 (351-487)	647 (509-788)	2426
Total population (2005 - 2006)	103 (96.1-109)	99.8 (90.3-107)	200 (185-210)	399 (365-429)	593 (463-746)	2448
Total population (2007 - 2008)	97.6 (91.6-104)	97.8 (90.9-106)	178 (164-195)	319 (283-353)	490 (426-557)	2601
Total population (2009 - 2010)	71.7 (67.1-76.7)	71.0 (67.0-76.0)	130 (121-140)	248 (225-265)	354 (303-412)	2746
Age 6-11 years (2001 - 2002)	105 (91.1-122)	109 (82.0-138)	195 (160-231)	298 (245-346)	412 (319-545)	387
Age 6-11 years (2003 - 2004)	116 (99.9-134)	107 (93.0-135)	205 (170-223)	333 (241-435)	472 (322-881)	325
Age 6-11 years (2005 - 2006)	89.6 (79.6-101)	84.0 (72.6-103)	154 (123-176)	245 (193-316)	316 (245-569)	345
Age 6-11 years (2007 - 2008)	100 (85.9-117)	102 (83.4-126)	175 (144-183)	251 (194-328)	348 (239-862)	389
Age 6-11 years (2009 - 2010)	66.2 (58.1-75.4)	69.0 (60.0-75.0)	110 (98.0-126)	198 (145-229)	285 (198-417)	416
Age 12-19 years (2001 - 2002)	104 (87.3-125)	107 (90.0-122)	201 (165-231)	329 (255-445)	459 (331-631)	733
Age 12-19 years (2003 - 2004)	120 (103-141)	127 (107-149)	221 (195-262)	366 (327-424)	564 (391-730)	677
Age 12-19 years (2005 - 2006)	105 (96.5-113)	104 (97.3-116)	193 (166-217)	323 (275-383)	453 (377-604)	676
Age 12-19 years (2007 - 2008)	103 (92.9-114)	103 (89.5-116)	173 (146-195)	293 (246-352)	371 (323-436)	401
Age 12-19 years (2009 - 2010)	77.5 (67.2-89.3)	75.0 (65.0-85.0)	136 (115-168)	237 (184-315)	320 (243-452)	420
Age 20+ years (2001 - 2002)	105 (91.7-119)	105 (89.0-118)	201 (180-231)	433 (366-515)	683 (597-806)	1621
Age 20+ years (2003 - 2004)	114 (103-128)	118 (105-130)	221 (203-243)	450 (353-505)	696 (511-885)	1424
Age 20+ years (2005 - 2006)	104 (95.3-113)	101 (89.6-113)	206 (188-223)	419 (384-466)	657 (481-832)	1427
Age 20+ years (2007 - 2008)	96.5 (89.3-104)	96.9 (87.3-106)	183 (163-201)	331 (285-393)	535 (432-624)	1811
Age 20+ years (2009 - 2010)	71.5 (66.8-76.6)	71.0 (67.0-75.0)	131 (121-147)	250 (233-279)	370 (308-435)	1910
Males (2001 - 2002)	122 (107-138)	117 (106-132)	224 (188-278)	474 (372-597)	734 (597-1010)	1344
Males (2003 - 2004)	137 (122-154)	135 (119-157)	251 (221-287)	487 (398-579)	754 (606-913)	1167
Males (2005 - 2006)	125 (114-137)	119 (107-136)	227 (204-261)	427 (395-491)	768 (520-951)	1222
Males (2007 - 2008)	117 (109-127)	115 (103-130)	209 (191-229)	352 (322-390)	557 (462-674)	1290
Males (2009 - 2010)	82.6 (76.0-89.7)	79.0 (73.0-85.0)	147 (126-169)	263 (242-302)	412 (344-466)	1399
Females (2001 - 2002)	90.8 (77.7-106)	93.0 (80.0-108)	184 (155-207)	328 (291-399)	518 (434-649)	1397
Females (2003 - 2004)	97.7 (86.5-110)	100 (86.6-114)	193 (170-210)	351 (287-445)	531 (447-647)	1259
Females (2005 - 2006)	84.6 (75.6-94.5)	82.4 (73.1-92.5)	159 (143-176)	363 (285-404)	480 (421-577)	1226
Females (2007 - 2008)	81.9 (76.8-87.3)	81.7 (74.7-91.0)	148 (134-173)	272 (237-326)	439 (355-501)	1311
Females (2009 - 2010)	62.7 (57.9-67.8)	64.0 (58.0-69.0)	119 (109-131)	223 (189-253)	311 (255-379)	1347

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 3.6, 5.0, 5.0, 5.0, and 10.0 respectively.

+Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyphenanthrene (2001 – 2010)

CAS Number 605-87-8

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	83.5 (64.1-109)	84.0 (64.0-111)	144 (117-198)	259 (193-430)	454 (253-1140)	664
Mexican Americans (2003 - 2004)	92.7 (81.3-106)	92.8 (84.1-111)	164 (133-204)	317 (236-374)	436 (338-501)	576
Mexican Americans (2005 - 2006)	77.0 (64.1-92.5)	74.8 (60.0-90.8)	138 (110-162)	260 (191-312)	366 (299-471)	620
Mexican Americans (2007 - 2008)	79.1 (71.4-87.7)	75.3 (66.4-85.2)	133 (118-154)	250 (176-330)	414 (302-511)	529
Mexican Americans (2009 - 2010)	56.9 (50.7-63.8)	54.0 (45.0-63.0)	96.0 (79.0-114)	193 (145-244)	317 (240-484)	566
Non-Hispanic blacks (2001 - 2002)	145 (122-172)	135 (120-163)	281 (228-346)	516 (414-684)	957 (609-1410)	690
Non-Hispanic blacks (2003 - 2004)	167 (141-198)	160 (136-198)	315 (243-414)	548 (457-688)	870 (590-1220)	668
Non-Hispanic blacks (2005 - 2006)	138 (120-159)	125 (113-147)	260 (211-329)	466 (365-671)	716 (491-1100)	658
Non-Hispanic blacks (2007 - 2008)	129 (115-145)	129 (112-148)	237 (205-266)	427 (349-514)	657 (514-839)	596
Non-Hispanic blacks (2009 - 2010)	103 (89.1-118)	110 (94.0-123)	196 (168-220)	310 (248-422)	456 (368-544)	517
Non-Hispanic whites (2001 - 2002)	104 (90.8-120)	106 (92.0-120)	199 (177-224)	401 (331-495)	649 (518-747)	1204
Non-Hispanic whites (2003 - 2004)	114 (100-129)	117 (104-128)	220 (201-235)	443 (333-511)	702 (505-915)	1000
Non-Hispanic whites (2005 - 2006)	101 (93.6-110)	101 (89.3-112)	200 (181-213)	402 (368-434)	657 (449-829)	982
Non-Hispanic whites (2007 - 2008)	97.0 (87.7-107)	97.9 (87.3-111)	179 (155-202)	315 (270-355)	468 (371-590)	1077
Non-Hispanic whites (2009 - 2010)	69.6 (63.3-76.5)	70.0 (65.0-75.0)	121 (110-137)	235 (203-263)	322 (255-410)	1203

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06,07-08, and 09-10 are 3.6, 5.0, 5.0,5.0, and 10.0 respectively.

+Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyphenanthrene (2011 – 2012)‡

CAS Number 605-87-8

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	61.9 (57.2-67.0)	62.0 (57.0-66.0)	127 (115-136)	235 (201-280)	377 (289-479)	2491
Age 6-11 years (2011 - 2012)	55.3 (48.4-63.2)	60.0 (48.0-73.0)	104 (92.0-122)	192 (169-248)	287 (214-413)	397
Age 12-19 years (2011 - 2012)	63.6 (55.1-73.5)	65.0 (57.0-76.0)	125 (115-144)	198 (169-235)	296 (200-389)	389
Age 20+ years (2011 - 2012)	62.4 (57.2-68.1)	61.0 (54.0-67.0)	130 (111-144)	251 (206-296)	413 (295-499)	1705
Males (2011 - 2012)	72.3 (63.9-81.7)	68.0 (60.0-78.0)	145 (127-168)	273 (205-392)	475 (296-651)	1258
Females (2011 - 2012)	53.4 (48.3-59.0)	55.0 (48.0-59.0)	105 (93.0-126)	207 (175-235)	297 (251-364)	1233
Mexican Americans (2011 - 2012)	54.8 (42.1-71.2)	54.0 (46.0-69.0)	103 (79.0-139)	197 (128-364)	308 (139-1270)	317
Non-Hispanic blacks (2011 - 2012)	92.6 (84.3-102)	98.0 (84.0-105)	185 (164-202)	348 (261-441)	519 (428-611)	664
Non-Hispanic whites (2011 - 2012)	58.2 (54.3-62.4)	58.0 (50.0-64.0)	119 (102-132)	221 (184-265)	325 (265-475)	813
All Hispanics (2011 - 2012)	61.3 (51.2-73.3)	61.0 (54.0-72.0)	123 (101-149)	230 (172-308)	377 (244-452)	573
Asians (2011 - 2012)	50.0 (39.8-62.9)	47.0 (37.0-59.0)	106 (69.0-141)	213 (136-278)	282 (215-400)	352

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyphenanthrene (creatinine corrected) (2001 – 2010)

CAS Number 605-87-8

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	98.0 (87.4-110)	86.5 (78.8-97.1)	158 (142-174)	299 (252-342)	428 (365-621)	2741
Total population (2003 - 2004)	108 (101-115)	99.5 (91.9-106)	172 (158-189)	321 (273-363)	497 (406-566)	2426
Total population (2005 - 2006)	99.5 (93.6-106)	88.1 (83.8-93.5)	164 (151-175)	326 (273-364)	443 (402-525)	2448
Total population (2007 - 2008)	98.1 (91.3-106)	91.3 (81.8-100)	159 (141-174)	273 (246-301)	380 (333-442)	2601
Total population (2009 - 2010)	74.9 (71.8-78.1)	68.4 (63.8-73.1)	114 (110-118)	207 (192-224)	281 (257-326)	2746
Age 6-11 years (2001 - 2002)	118 (103-135)	114 (94.9-131)	173 (150-201)	289 (238-368)	410 (308-544)	387
Age 6-11 years (2003 - 2004)	124 (110-138)	119 (110-129)	165 (145-202)	283 (231-402)	484 (269-710)	325
Age 6-11 years (2005 - 2006)	99.6 (89.4-111)	93.5 (85.7-107)	146 (118-165)	232 (171-292)	292 (232-352)	345
Age 6-11 years (2007 - 2008)	123 (107-142)	120 (105-143)	183 (159-200)	230 (201-382)	382 (222-948)	389
Age 6-11 years (2009 - 2010)	86.3 (77.7-95.9)	77.9 (69.6-90.6)	129 (110-136)	194 (161-252)	290 (193-484)	416
Age 12-19 years (2001 - 2002)	81.1 (70.1-93.8)	78.0 (66.7-89.4)	116 (96.5-144)	205 (153-275)	283 (198-511)	733
Age 12-19 years (2003 - 2004)	90.3 (81.5-100)	84.9 (76.1-93.9)	139 (116-160)	212 (193-231)	295 (225-429)	677
Age 12-19 years (2005 - 2006)	78.2 (70.9-86.3)	72.5 (66.7-82.1)	111 (98.8-121)	183 (141-262)	291 (211-465)	676
Age 12-19 years (2007 - 2008)	80.0 (73.6-86.9)	74.4 (67.0-87.5)	117 (110-126)	188 (151-223)	243 (213-284)	401
Age 12-19 years (2009 - 2010)	62.3 (57.4-67.6)	60.5 (55.7-64.1)	88.8 (78.2-98.0)	123 (105-182)	190 (124-228)	420
Age 20+ years (2001 - 2002)	98.9 (88.3-111)	85.3 (78.3-96.6)	164 (147-183)	320 (273-356)	488 (379-774)	1621
Age 20+ years (2003 - 2004)	109 (102-117)	99.1 (91.7-106)	180 (161-198)	343 (282-385)	523 (417-608)	1424
Age 20+ years (2005 - 2006)	103 (96.3-111)	90.3 (84.4-97.8)	177 (161-200)	350 (319-387)	506 (426-538)	1427
Age 20+ years (2007 - 2008)	98.8 (91.2-107)	90.3 (80.2-100)	163 (140-184)	290 (262-321)	388 (338-464)	1811
Age 20+ years (2009 - 2010)	75.8 (72.4-79.3)	69.0 (63.6-73.6)	118 (113-124)	220 (200-239)	297 (260-341)	1910
Males (2001 - 2002)	98.6 (87.7-111)	87.1 (79.5-98.2)	159 (138-188)	310 (245-368)	505 (356-761)	1344
Males (2003 - 2004)	107 (98.2-116)	99.2 (87.4-109)	169 (154-184)	305 (261-343)	491 (383-592)	1167
Males (2005 - 2006)	100 (92.6-109)	89.2 (81.5-97.0)	166 (147-184)	326 (260-365)	430 (364-553)	1222
Males (2007 - 2008)	98.9 (91.2-107)	91.3 (81.3-101)	166 (146-184)	288 (263-310)	382 (321-449)	1290
Males (2009 - 2010)	74.1 (69.7-78.8)	66.4 (59.5-73.8)	117 (108-126)	217 (193-234)	296 (245-351)	1399
Females (2001 - 2002)	97.5 (84.9-112)	86.4 (76.9-100)	158 (139-178)	292 (245-333)	410 (352-583)	1397
Females (2003 - 2004)	109 (99.6-119)	100 (88.9-110)	176 (155-202)	328 (265-398)	497 (380-594)	1259
Females (2005 - 2006)	98.7 (91.6-106)	87.3 (80.4-95.1)	160 (144-177)	332 (284-375)	446 (393-518)	1226
Females (2007 - 2008)	97.4 (89.6-106)	90.9 (79.4-102)	150 (131-181)	262 (223-305)	377 (299-446)	1311
Females (2009 - 2010)	75.6 (71.6-79.8)	69.4 (64.7-75.0)	113 (107-118)	196 (182-219)	274 (241-331)	1347

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyphenanthrene (creatinine corrected) (2001 – 2010)

CAS Number 605-87-8

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	78.2 (62.4-98.0)	70.8 (56.2-87.4)	130 (92.9-171)	224 (173-321)	333 (224-656)	664
Mexican Americans (2003 - 2004)	83.8 (75.1-93.6)	79.5 (72.9-87.0)	137 (111-165)	224 (188-274)	305 (247-406)	576
Mexican Americans (2005 - 2006)	68.8 (61.0-77.7)	61.3 (51.5-73.2)	96.9 (82.9-122)	175 (159-206)	291 (200-387)	620
Mexican Americans (2007 - 2008)	77.1 (68.5-86.7)	71.6 (63.1-78.8)	113 (99.6-133)	200 (160-227)	275 (230-334)	529
Mexican Americans (2009 - 2010)	56.5 (49.6-64.3)	48.4 (42.7-57.0)	82.4 (67.4-97.4)	170 (119-252)	265 (201-417)	566
Non-Hispanic blacks (2001 - 2002)	102 (85.8-122)	91.9 (79.8-108)	160 (133-202)	296 (234-475)	673 (347-1260)	690
Non-Hispanic blacks (2003 - 2004)	117 (102-135)	106 (89.4-126)	186 (157-217)	346 (264-439)	530 (373-772)	668
Non-Hispanic blacks (2005 - 2006)	97.0 (86.6-109)	85.7 (77.3-94.1)	141 (125-172)	271 (217-366)	443 (283-623)	658
Non-Hispanic blacks (2007 - 2008)	101 (88.7-114)	91.3 (80.9-104)	176 (143-208)	297 (238-360)	411 (344-512)	596
Non-Hispanic blacks (2009 - 2010)	74.3 (67.8-81.5)	69.4 (61.4-78.2)	122 (103-140)	194 (176-230)	264 (223-330)	517
Non-Hispanic whites (2001 - 2002)	103 (91.5-117)	89.4 (80.2-102)	167 (148-193)	324 (272-368)	447 (365-738)	1204
Non-Hispanic whites (2003 - 2004)	112 (104-121)	103 (97.2-108)	183 (161-200)	346 (276-402)	544 (417-690)	1000
Non-Hispanic whites (2005 - 2006)	106 (98.8-114)	93.6 (86.4-102)	178 (160-206)	348 (317-387)	506 (416-551)	982
Non-Hispanic whites (2007 - 2008)	101 (91.1-112)	96.5 (83.5-107)	163 (137-190)	280 (243-317)	378 (316-447)	1077
Non-Hispanic whites (2009 - 2010)	78.3 (73.8-83.0)	72.7 (66.0-79.5)	117 (111-124)	214 (189-238)	281 (253-326)	1203

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Hydroxyphenanthrene (creatinine corrected) (2011 – 2012)†

CAS Number 605-87-8

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	70.5 (66.7-74.6)	62.6 (58.5-67.3)	118 (104-128)	226 (201-247)	325 (271-366)	2489
Age 6-11 years (2011 - 2012)	79.6 (71.8-88.3)	73.9 (65.0-84.2)	116 (100-131)	170 (140-220)	238 (168-383)	396
Age 12-19 years (2011 - 2012)	61.5 (56.0-67.6)	55.7 (47.0-69.0)	89.0 (83.2-101)	150 (121-196)	229 (173-243)	389
Age 20+ years (2011 - 2012)	71.0 (66.9-75.4)	61.6 (58.3-67.0)	123 (110-139)	246 (209-258)	334 (278-409)	1704
Males (2011 - 2012)	67.8 (61.9-74.2)	60.4 (52.2-68.5)	117 (99.1-130)	222 (188-246)	320 (243-474)	1257
Females (2011 - 2012)	73.2 (67.0-80.0)	64.2 (59.7-72.1)	120 (99.2-138)	238 (187-271)	325 (276-362)	1232
Mexican Americans (2011 - 2012)	61.6 (50.6-75.0)	54.2 (44.9-66.7)	91.4 (75.2-118)	204 (110-343)	303 (195-556)	317
Non-Hispanic blacks (2011 - 2012)	72.1 (66.5-78.1)	68.3 (60.5-77.5)	117 (106-134)	202 (163-245)	311 (239-388)	664
Non-Hispanic whites (2011 - 2012)	70.8 (66.7-75.2)	62.0 (56.8-67.4)	121 (105-131)	238 (200-254)	325 (258-383)	811
All Hispanics (2011 - 2012)	68.6 (60.2-78.1)	61.8 (54.3-73.2)	104 (88.1-126)	206 (150-291)	343 (225-500)	573
Asians (2011 - 2012)	67.0 (55.6-80.7)	60.8 (50.5-79.6)	107 (82.1-144)	178 (150-206)	255 (184-354)	352

†Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2- & 3-Hydroxyphenanthrene (2013 – 2014)

CAS Number 605-55-0 & 605-87-8

Metabolites of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	115 (108-123)	112 (104-120)	214 (193-232)	389 (350-432)	544 (493-613)	2650
Age 6-11 years (2013 - 2014)	90.4 (80.7-101)	85.0 (76.0-95.0)	166 (126-188)	262 (222-349)	378 (266-619)	399
Age 12-19 years (2013 - 2014)	122 (101-149)	137 (100-168)	231 (184-285)	351 (298-450)	536 (358-614)	449
Age 20+ years (2013 - 2014)	117 (109-125)	113 (103-123)	218 (195-237)	409 (361-467)	554 (503-673)	1802
Males (2013 - 2014)	129 (120-139)	128 (116-138)	230 (200-252)	426 (361-502)	593 (502-713)	1315
Females (2013 - 2014)	102 (94.6-111)	98.0 (86.0-109)	197 (181-219)	355 (312-409)	498 (416-599)	1335
Mexican Americans (2013 - 2014)	96.4 (90.4-103)	97.0 (88.0-109)	170 (149-191)	272 (238-311)	347 (290-426)	450
Non-Hispanic blacks (2013 - 2014)	180 (162-201)	164 (145-188)	331 (270-396)	566 (476-687)	742 (632-1040)	578
Non-Hispanic whites (2013 - 2014)	111 (102-121)	107 (94.0-121)	214 (188-234)	386 (338-446)	544 (477-628)	979
All Hispanics (2013 - 2014)	102 (93.3-111)	102 (92.0-115)	180 (151-204)	289 (248-321)	369 (321-426)	698
Asians (2013 - 2014)	88.4 (71.2-110)	81.0 (70.0-110)	148 (118-178)	236 (170-499)	493 (216-749)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 10.0.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2- & 3-Hydroxyphenanthrene (creatinine corrected) (2013 – 2014)

CAS Number 605-55-0 & 605-87-8

Metabolites of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	133 (127-140)	126 (119-133)	197 (188-210)	333 (303-375)	458 (424-507)	2649
Age 6-11 years (2013 - 2014)	136 (123-150)	133 (116-152)	188 (164-205)	316 (241-375)	422 (358-435)	399
Age 12-19 years (2013 - 2014)	111 (101-122)	100 (91.4-109)	158 (138-172)	253 (194-340)	373 (294-454)	449
Age 20+ years (2013 - 2014)	137 (130-144)	129 (123-137)	206 (195-217)	348 (309-386)	484 (431-525)	1801
Males (2013 - 2014)	130 (122-137)	123 (113-134)	193 (184-209)	324 (272-369)	439 (386-507)	1314
Females (2013 - 2014)	137 (128-146)	128 (120-140)	202 (190-214)	345 (305-406)	482 (420-557)	1335
Mexican Americans (2013 - 2014)	110 (102-120)	104 (94.0-112)	166 (147-188)	241 (211-310)	364 (265-452)	450
Non-Hispanic blacks (2013 - 2014)	138 (125-152)	131 (113-148)	208 (183-245)	363 (294-427)	477 (406-543)	578
Non-Hispanic whites (2013 - 2014)	137 (129-147)	130 (123-141)	202 (188-216)	359 (309-413)	483 (431-514)	978
All Hispanics (2013 - 2014)	114 (105-123)	107 (96.9-117)	171 (151-190)	255 (231-299)	333 (304-391)	698
Asians (2013 - 2014)	139 (115-167)	139 (118-161)	206 (170-246)	296 (226-458)	458 (275-616)	291

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 4-Hydroxyphenanthrene (2003 – 2006)‡

CAS Number 7657-86-7

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	25.1 (22.6-27.9)	25.9 (22.5-29.6)	53.7 (47.4-59.7)	96.8 (85.0-116)	152 (118-176)	2443
Total population (2005 - 2006)	29.3 (26.7-32.2)	29.2 (25.1-31.8)	56.9 (50.1-66.1)	108 (93.1-124)	157 (134-176)	2131
Age 6-11 years (2003 - 2004)	25.2 (22.3-28.4)	26.3 (22.8-30.0)	45.7 (38.6-53.3)	95.5 (61.7-137)	138 (95.1-202)	321
Age 6-11 years (2005 - 2006)	20.4 (17.7-23.4)	20.2 (17.6-23.8)	35.1 (27.4-41.6)	59.6 (43.3-93.0)	96.1 (62.2-155)	307
Age 12-19 years (2003 - 2004)	23.7 (20.3-27.6)	25.8 (20.5-31.4)	49.9 (45.2-53.0)	77.4 (67.2-95.1)	123 (94.6-142)	683
Age 12-19 years (2005 - 2006)	26.6 (23.0-30.8)	27.6 (22.4-31.2)	50.9 (43.5-56.8)	79.4 (71.1-89.9)	108 (89.9-140)	568
Age 20+ years (2003 - 2004)	25.3 (22.4-28.6)	25.8 (22.4-29.5)	54.8 (48.6-61.9)	101 (87.1-120)	163 (117-197)	1439
Age 20+ years (2005 - 2006)	31.1 (28.1-34.3)	30.7 (26.4-33.7)	62.9 (52.6-75.1)	119 (97.1-140)	165 (138-188)	1256
Males (2003 - 2004)	30.0 (26.5-34.0)	29.6 (25.5-35.1)	60.4 (53.4-68.7)	110 (90.6-130)	169 (118-211)	1180
Males (2005 - 2006)	31.9 (28.6-35.5)	30.7 (25.0-36.8)	60.3 (49.7-72.7)	111 (92.3-134)	153 (119-226)	1064
Females (2003 - 2004)	21.1 (18.7-23.8)	21.3 (18.3-25.3)	46.5 (41.6-53.3)	88.4 (73.5-103)	136 (106-157)	1263
Females (2005 - 2006)	27.1 (23.4-31.4)	26.6 (22.7-31.1)	54.0 (41.9-66.9)	107 (82.6-140)	165 (120-189)	1067
Mexican Americans (2003 - 2004)	23.5 (20.9-26.3)	24.4 (21.4-29.4)	46.1 (40.1-53.0)	80.5 (60.9-94.1)	99.7 (80.2-154)	607
Mexican Americans (2005 - 2006)	24.5 (20.3-29.6)	24.8 (20.2-31.3)	43.7 (37.2-54.5)	81.2 (62.8-94.4)	112 (82.6-134)	466
Non-Hispanic blacks (2003 - 2004)	35.4 (29.6-42.3)	37.1 (29.8-46.1)	71.4 (60.3-83.3)	123 (104-145)	167 (133-215)	657
Non-Hispanic blacks (2005 - 2006)	36.8 (31.8-42.5)	33.6 (29.7-42.0)	66.0 (56.0-80.5)	130 (98.0-168)	190 (133-276)	612
Non-Hispanic whites (2003 - 2004)	24.4 (21.5-27.7)	25.2 (21.8-29.1)	51.5 (45.1-58.5)	97.9 (77.4-127)	163 (113-202)	1021
Non-Hispanic whites (2005 - 2006)	28.6 (25.2-32.4)	28.6 (24.5-31.9)	55.5 (47.3-69.3)	108 (90.9-136)	163 (134-188)	890

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04 and 05-06 are 5.0 and 5.0 respectively.

‡Not measured in Survey years 2007-2008 and 2009-2010 because of potential interferences that would affect the quality of the results.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 4-Hydroxyphenanthrene (2011 – 2012)

CAS Number 7657-86-7

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	20.5 (19.3-21.8)	19.0 (18.0-21.0)	36.0 (34.0-40.0)	74.0 (62.0-82.0)	99.0 (88.0-114)	2487
Age 6-11 years (2011 - 2012)	17.1 (15.6-18.8)	16.0 (13.0-19.0)	32.0 (25.0-37.0)	54.0 (46.0-59.0)	72.0 (56.0-96.0)	397
Age 12-19 years (2011 - 2012)	20.4 (18.1-23.0)	18.0 (17.0-23.0)	34.0 (31.0-42.0)	57.0 (47.0-75.0)	84.0 (57.0-120)	389
Age 20+ years (2011 - 2012)	21.0 (19.6-22.4)	20.0 (18.0-21.0)	38.0 (35.0-42.0)	78.0 (69.0-87.0)	101 (89.0-128)	1701
Males (2011 - 2012)	21.6 (19.8-23.7)	22.0 (18.0-24.0)	38.0 (34.0-43.0)	74.0 (63.0-83.0)	99.0 (85.0-124)	1255
Females (2011 - 2012)	19.5 (18.1-21.1)	18.0 (16.0-19.0)	36.0 (33.0-40.0)	74.0 (59.0-82.0)	98.0 (87.0-114)	1232
Mexican Americans (2011 - 2012)	19.7 (16.2-24.0)	18.0 (15.0-22.0)	34.0 (27.0-45.0)	65.0 (40.0-96.0)	91.0 (53.0-130)	317
Non-Hispanic blacks (2011 - 2012)	28.4 (26.0-31.0)	28.0 (25.0-31.0)	50.0 (44.0-57.0)	90.0 (75.0-109)	122 (103-136)	662
Non-Hispanic whites (2011 - 2012)	19.4 (18.3-20.5)	18.0 (16.0-20.0)	35.0 (32.0-38.0)	73.0 (57.0-81.0)	94.0 (82.0-114)	812
All Hispanics (2011 - 2012)	21.0 (18.5-23.8)	20.0 (17.0-23.0)	38.0 (32.0-46.0)	68.0 (52.0-88.0)	91.0 (69.0-122)	573
Asians (2011 - 2012)	16.8 (14.7-19.1)	15.0 (13.0-17.0)	30.0 (25.0-33.0)	55.0 (37.0-86.0)	91.0 (53.0-110)	351

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 10.0.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 4-Hydroxyphenanthrene (creatinine corrected) (2003 – 2006)‡

CAS Number 7657-86-7

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	23.3 (21.7-25.0)	22.7 (20.5-24.9)	42.0 (38.6-44.6)	74.3 (66.3-85.4)	114 (102-130)	2443
Total population (2005 - 2006)	28.9 (26.6-31.4)	26.9 (24.1-29.4)	48.4 (43.9-53.7)	88.3 (77.5-102)	127 (106-145)	2131
Age 6-11 years (2003 - 2004)	26.3 (23.7-29.2)	24.8 (21.6-28.6)	43.3 (35.2-48.8)	72.9 (56.3-113)	126 (79.3-173)	321
Age 6-11 years (2005 - 2006)	22.9 (19.8-26.5)	21.7 (20.0-24.8)	36.2 (27.8-43.7)	50.0 (42.7-79.3)	79.3 (50.0-98.3)	307
Age 12-19 years (2003 - 2004)	17.7 (15.9-19.8)	16.7 (15.7-18.4)	31.4 (26.0-37.1)	47.9 (40.7-54.1)	61.7 (51.7-86.0)	683
Age 12-19 years (2005 - 2006)	20.1 (18.2-22.2)	19.0 (16.5-22.9)	30.0 (28.3-33.0)	48.7 (41.0-63.5)	79.4 (53.8-98.2)	568
Age 20+ years (2003 - 2004)	24.0 (22.0-26.2)	23.3 (21.1-25.4)	43.5 (39.4-48.1)	79.0 (66.8-100)	121 (104-138)	1439
Age 20+ years (2005 - 2006)	31.4 (29.0-34.1)	29.4 (26.9-32.4)	54.6 (48.0-61.6)	102 (86.4-109)	139 (115-166)	1256
Males (2003 - 2004)	23.4 (21.6-25.4)	22.7 (20.3-24.9)	40.9 (35.9-45.7)	72.7 (61.5-86.8)	112 (100-126)	1180
Males (2005 - 2006)	26.1 (23.8-28.7)	24.1 (22.2-28.2)	44.3 (40.0-51.1)	74.3 (61.6-87.7)	102 (87.3-120)	1064
Females (2003 - 2004)	23.2 (21.2-25.5)	22.8 (19.7-26.0)	42.5 (38.3-46.2)	75.1 (63.4-94.0)	119 (93.1-139)	1263
Females (2005 - 2006)	31.8 (28.7-35.3)	28.9 (25.8-31.8)	54.2 (46.0-63.2)	103 (85.4-127)	145 (119-174)	1067
Mexican Americans (2003 - 2004)	21.2 (18.8-23.8)	20.7 (19.1-22.9)	35.9 (29.8-40.7)	59.0 (43.3-87.5)	83.4 (60.9-139)	607
Mexican Americans (2005 - 2006)	22.5 (20.1-25.3)	21.6 (18.8-27.1)	34.7 (31.4-41.5)	54.5 (48.2-61.6)	81.3 (59.8-86.1)	466
Non-Hispanic blacks (2003 - 2004)	25.0 (21.6-28.9)	25.3 (23.1-28.8)	42.0 (37.4-51.4)	75.0 (61.6-87.9)	102 (79.2-137)	657
Non-Hispanic blacks (2005 - 2006)	25.8 (23.0-29.0)	24.5 (22.0-26.8)	39.4 (36.2-44.7)	68.5 (59.8-88.6)	103 (80.0-146)	612
Non-Hispanic whites (2003 - 2004)	23.7 (21.5-26.2)	22.4 (19.4-25.4)	43.6 (38.8-47.3)	82.2 (68.5-101)	126 (103-143)	1021
Non-Hispanic whites (2005 - 2006)	30.5 (27.3-34.1)	28.5 (25.0-31.6)	53.0 (45.5-61.5)	102 (83.0-115)	138 (112-174)	890

‡Not measured in Survey years 2007-2008 and 2009-2010 because of potential interferences that would affect the quality of the results.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 4-Hydroxyphenanthrene (creatinine corrected) (2011 – 2012)

CAS Number 7657-86-7

Metabolite of Phenanthrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	23.3 (22.4-24.2)	22.0 (20.9-22.9)	36.9 (33.8-40.0)	65.0 (60.0-76.3)	106 (85.9-121)	2485
Age 6-11 years (2011 - 2012)	24.4 (22.1-26.9)	23.7 (21.5-25.9)	36.2 (31.9-39.1)	55.0 (47.9-69.7)	78.9 (57.1-126)	396
Age 12-19 years (2011 - 2012)	19.7 (17.7-21.9)	19.7 (17.2-21.7)	28.4 (26.3-34.7)	46.6 (38.5-57.9)	64.9 (46.1-78.9)	389
Age 20+ years (2011 - 2012)	23.8 (22.6-25.0)	22.1 (20.9-23.3)	38.4 (34.2-43.8)	70.5 (60.0-88.8)	115 (91.4-136)	1700
Males (2011 - 2012)	20.3 (19.3-21.4)	19.4 (18.5-20.6)	31.4 (28.4-35.4)	57.7 (53.3-63.8)	79.6 (63.8-111)	1254
Females (2011 - 2012)	26.6 (24.9-28.5)	24.5 (22.9-26.2)	41.8 (37.4-46.6)	78.9 (66.7-88.8)	117 (95.7-142)	1231
Mexican Americans (2011 - 2012)	22.2 (19.1-25.8)	20.9 (19.2-23.6)	35.5 (29.6-42.1)	59.7 (43.2-67.6)	67.6 (48.0-183)	317
Non-Hispanic blacks (2011 - 2012)	22.1 (20.3-24.0)	21.3 (19.7-23.4)	34.9 (30.8-38.8)	53.5 (49.0-61.3)	74.5 (63.7-84.7)	662
Non-Hispanic whites (2011 - 2012)	23.5 (22.1-24.9)	22.0 (20.3-23.4)	37.3 (32.3-43.7)	70.5 (60.0-81.6)	111 (88.8-142)	810
All Hispanics (2011 - 2012)	23.5 (21.2-25.9)	22.9 (20.7-25.5)	37.4 (33.0-41.8)	60.1 (45.5-79.6)	90.7 (60.1-133)	573
Asians (2011 - 2012)	22.5 (20.2-25.1)	21.5 (17.9-24.5)	34.9 (32.3-40.1)	60.8 (50.5-71.0)	85.1 (64.2-102)	351

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Phenanthrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxypyrene (2003 – 2010)

CAS Number 5315-79-7

Metabolite of Pyrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	89.2 (79.8-99.7)	91.3 (83.5-98.8)	189 (168-208)	389 (345-459)	569 (493-676)	2515
Total population (2005 - 2006)	98.3 (91.0-106)	94.0 (85.5-102)	206 (181-227)	440 (373-521)	673 (585-829)	2415
Total population (2007 - 2008)	118 (108-129)	118 (107-133)	233 (208-263)	439 (392-487)	675 (543-844)	2581
Total population (2009 - 2010)	119 (110-130)	118 (109-129)	231 (213-251)	451 (401-509)	675 (580-822)	2746
Age 6-11 years (2003 - 2004)	112 (96.9-130)	119 (99.0-143)	193 (163-229)	351 (233-484)	514 (336-680)	333
Age 6-11 years (2005 - 2006)	103 (91.3-117)	99.8 (91.7-105)	170 (139-206)	342 (222-413)	469 (353-786)	342
Age 6-11 years (2007 - 2008)	146 (127-168)	149 (131-171)	231 (203-288)	395 (293-557)	569 (395-1060)	387
Age 6-11 years (2009 - 2010)	147 (125-174)	143 (127-164)	245 (203-312)	443 (312-681)	756 (383-2410)	415
Age 12-19 years (2003 - 2004)	119 (103-137)	115 (98.0-145)	244 (213-274)	506 (359-608)	705 (636-788)	705
Age 12-19 years (2005 - 2006)	118 (104-134)	108 (93.2-132)	218 (179-266)	409 (332-557)	837 (481-992)	667
Age 12-19 years (2007 - 2008)	149 (130-170)	145 (118-165)	282 (228-343)	452 (399-515)	614 (476-843)	401
Age 12-19 years (2009 - 2010)	152 (132-174)	156 (130-175)	280 (237-305)	414 (348-543)	642 (452-910)	420
Age 20+ years (2003 - 2004)	82.8 (73.0-93.8)	83.8 (75.6-92.4)	177 (155-203)	387 (337-437)	553 (483-644)	1477
Age 20+ years (2005 - 2006)	94.9 (86.3-104)	89.1 (79.8-100)	208 (173-245)	476 (368-563)	677 (563-913)	1406
Age 20+ years (2007 - 2008)	111 (100-123)	114 (95.7-129)	226 (199-258)	446 (370-506)	719 (525-904)	1793
Age 20+ years (2009 - 2010)	113 (103-122)	110 (103-119)	222 (199-244)	452 (401-531)	674 (559-837)	1911
Males (2003 - 2004)	108 (96.0-122)	111 (98.7-121)	227 (197-265)	459 (387-518)	644 (526-811)	1214
Males (2005 - 2006)	114 (104-125)	108 (98.4-119)	235 (196-279)	465 (386-585)	793 (634-980)	1208
Males (2007 - 2008)	134 (120-150)	131 (113-155)	260 (229-293)	474 (409-560)	748 (554-956)	1279
Males (2009 - 2010)	128 (114-143)	128 (114-141)	230 (205-251)	465 (393-555)	713 (559-923)	1398
Females (2003 - 2004)	74.0 (64.3-85.1)	75.3 (66.3-83.9)	158 (143-173)	334 (258-407)	502 (389-604)	1301
Females (2005 - 2006)	84.8 (74.5-96.5)	80.0 (69.8-89.9)	173 (148-213)	421 (313-521)	617 (534-677)	1207
Females (2007 - 2008)	105 (94.7-116)	111 (92.6-123)	213 (194-227)	387 (342-444)	580 (486-769)	1302
Females (2009 - 2010)	112 (101-125)	109 (98.0-124)	231 (209-260)	425 (390-495)	652 (566-780)	1348

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Pyrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxypyrene (2003 – 2010)

CAS Number 5315-79-7

Metabolite of Pyrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	89.4 (78.6-102)	92.4 (79.8-113)	173 (153-191)	331 (281-415)	495 (404-548)	623
Mexican Americans (2005 - 2006)	95.6 (81.0-113)	92.3 (80.1-112)	179 (149-220)	332 (261-455)	490 (367-756)	611
Mexican Americans (2007 - 2008)	119 (110-129)	117 (104-132)	196 (170-230)	380 (289-494)	593 (485-755)	531
Mexican Americans (2009 - 2010)	134 (122-147)	134 (116-154)	245 (198-314)	453 (392-591)	706 (551-975)	566
Non-Hispanic blacks (2003 - 2004)	128 (105-157)	127 (111-157)	296 (226-356)	552 (399-669)	702 (569-935)	663
Non-Hispanic blacks (2005 - 2006)	116 (98.5-137)	108 (91.0-124)	230 (185-332)	517 (401-639)	743 (559-1060)	653
Non-Hispanic blacks (2007 - 2008)	136 (122-153)	142 (122-160)	282 (250-320)	548 (480-610)	752 (617-871)	592
Non-Hispanic blacks (2009 - 2010)	165 (146-188)	170 (142-201)	321 (280-392)	656 (557-727)	989 (727-1370)	516
Non-Hispanic whites (2003 - 2004)	84.6 (73.3-97.8)	85.2 (75.2-97.4)	182 (156-213)	386 (336-463)	566 (464-748)	1040
Non-Hispanic whites (2005 - 2006)	94.9 (85.4-106)	91.3 (80.3-104)	203 (170-235)	399 (351-538)	677 (563-899)	968
Non-Hispanic whites (2007 - 2008)	116 (102-131)	117 (102-136)	235 (198-287)	436 (364-500)	719 (473-981)	1059
Non-Hispanic whites (2009 - 2010)	108 (96.3-122)	107 (99.0-118)	209 (176-239)	398 (329-474)	603 (495-739)	1203

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 5.0, 5.0, 5.0, and 10.0 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Pyrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxypyrene (2011 – 2014)

CAS Number 5315-79-7

Metabolite of Pyrene

Geometric mean and selected percentiles of urine concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	111 (101-123)	113 (99.0-124)	217 (196-254)	437 (373-501)	635 (538-784)	2487
Total population (2013 - 2014)	132 (124-140)	119 (111-127)	226 (209-235)	433 (381-495)	650 (544-733)	2650
Age 6-11 years (2011 - 2012)	130 (111-153)	127 (107-160)	252 (202-301)	386 (362-462)	521 (431-693)	397
Age 6-11 years (2013 - 2014)	131 (118-145)	125 (111-142)	218 (191-259)	376 (276-495)	544 (461-615)	399
Age 12-19 years (2011 - 2012)	131 (110-156)	141 (117-159)	247 (199-331)	451 (331-547)	555 (454-716)	387
Age 12-19 years (2013 - 2014)	160 (133-192)	165 (127-191)	276 (225-352)	432 (352-666)	748 (432-849)	449
Age 20+ years (2011 - 2012)	107 (96.2-119)	104 (95.0-118)	208 (181-244)	443 (373-504)	685 (543-882)	1703
Age 20+ years (2013 - 2014)	128 (120-137)	113 (105-122)	215 (200-232)	438 (374-497)	656 (514-773)	1802
Males (2011 - 2012)	122 (107-139)	121 (103-131)	231 (198-276)	494 (380-606)	756 (547-1020)	1255
Males (2013 - 2014)	134 (124-146)	122 (110-136)	225 (207-244)	450 (363-511)	621 (544-690)	1315
Females (2011 - 2012)	102 (92.6-113)	104 (92.0-117)	209 (183-243)	384 (340-447)	543 (443-652)	1232
Females (2013 - 2014)	129 (121-138)	115 (106-125)	226 (206-238)	429 (376-494)	665 (518-773)	1335
Mexican Americans (2011 - 2012)	127 (104-157)	129 (112-157)	225 (191-262)	435 (262-685)	685 (342-1060)	316
Mexican Americans (2013 - 2014)	125 (117-133)	121 (112-132)	204 (174-212)	295 (251-386)	428 (348-519)	450
Non-Hispanic blacks (2011 - 2012)	140 (123-160)	138 (117-168)	292 (246-335)	476 (384-685)	779 (596-1070)	662
Non-Hispanic blacks (2013 - 2014)	182 (168-198)	170 (150-192)	358 (305-393)	576 (484-690)	836 (633-1020)	578
Non-Hispanic whites (2011 - 2012)	104 (94.6-113)	102 (94.0-116)	199 (176-231)	447 (349-513)	606 (504-803)	812
Non-Hispanic whites (2013 - 2014)	128 (118-138)	111 (101-124)	222 (194-237)	450 (374-511)	656 (544-773)	979
All Hispanics (2011 - 2012)	131 (114-152)	136 (119-156)	248 (209-279)	416 (329-501)	654 (440-873)	572
All Hispanics (2013 - 2014)	129 (120-139)	124 (114-141)	209 (196-225)	328 (276-398)	450 (398-556)	698
Asians (2011 - 2012)	85.6 (72.3-101)	78.0 (65.0-94.0)	175 (124-218)	301 (243-359)	373 (325-571)	352
Asians (2013 - 2014)	93.2 (83.6-104)	83.0 (72.0-101)	137 (120-146)	227 (166-310)	312 (263-426)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 10.0 and 70.0, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Pyrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxypyrene (creatinine corrected) (2003 – 2010)

CAS Number 5315-79-7

Metabolite of Pyrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	83.4 (77.4-90.0)	79.9 (72.6-86.9)	149 (133-167)	279 (236-343)	424 (352-474)	2515
Total population (2005 - 2006)	95.1 (89.1-102)	85.5 (81.0-91.1)	173 (161-184)	338 (292-371)	492 (427-550)	2415
Total population (2007 - 2008)	119 (110-129)	113 (103-127)	200 (180-224)	364 (321-411)	527 (467-587)	2581
Total population (2009 - 2010)	125 (116-134)	117 (109-126)	202 (187-222)	366 (337-401)	530 (485-583)	2746
Age 6-11 years (2003 - 2004)	119 (102-138)	112 (98.2-137)	185 (156-225)	336 (227-440)	475 (336-566)	333
Age 6-11 years (2005 - 2006)	115 (102-128)	105 (94.7-116)	181 (145-217)	285 (242-385)	407 (308-517)	342
Age 6-11 years (2007 - 2008)	180 (156-206)	171 (145-197)	255 (233-316)	457 (329-593)	604 (457-1320)	387
Age 6-11 years (2009 - 2010)	192 (164-225)	181 (161-203)	283 (232-355)	471 (356-836)	812 (405-2030)	415
Age 12-19 years (2003 - 2004)	89.4 (77.7-103)	81.5 (74.3-93.0)	146 (123-187)	269 (196-364)	364 (251-611)	705
Age 12-19 years (2005 - 2006)	88.7 (78.7-99.9)	80.9 (73.8-92.3)	146 (115-176)	250 (199-358)	400 (252-682)	667
Age 12-19 years (2007 - 2008)	116 (105-127)	112 (98.3-127)	178 (154-202)	301 (245-349)	405 (321-558)	401
Age 12-19 years (2009 - 2010)	122 (111-133)	121 (108-133)	176 (155-198)	262 (211-337)	371 (280-421)	420
Age 20+ years (2003 - 2004)	79.1 (73.2-85.4)	73.5 (66.7-82.3)	142 (127-160)	278 (236-331)	424 (349-472)	1477
Age 20+ years (2005 - 2006)	94.1 (87.1-102)	82.5 (75.8-89.3)	177 (163-194)	352 (294-397)	502 (444-558)	1406
Age 20+ years (2007 - 2008)	114 (105-125)	106 (95.3-124)	194 (173-217)	364 (317-415)	510 (456-591)	1793
Age 20+ years (2009 - 2010)	119 (111-128)	109 (104-118)	199 (178-220)	365 (336-407)	530 (481-606)	1911
Males (2003 - 2004)	84.8 (77.3-93.1)	82.8 (72.7-91.0)	163 (145-175)	290 (241-352)	416 (353-513)	1214
Males (2005 - 2006)	91.6 (84.3-99.6)	84.6 (76.9-95.5)	169 (152-182)	308 (268-364)	492 (426-589)	1208
Males (2007 - 2008)	113 (102-125)	109 (94.3-124)	193 (176-214)	379 (308-440)	549 (456-629)	1279
Males (2009 - 2010)	115 (104-126)	105 (93.9-116)	184 (168-205)	362 (317-419)	546 (452-708)	1398
Females (2003 - 2004)	82.1 (73.5-91.7)	78.3 (69.2-86.8)	137 (119-169)	274 (215-350)	440 (313-479)	1301
Females (2005 - 2006)	98.7 (91.7-106)	86.8 (78.5-92.8)	175 (156-195)	345 (295-390)	482 (395-558)	1207
Females (2007 - 2008)	125 (114-137)	119 (104-135)	203 (179-238)	348 (302-405)	503 (425-619)	1302
Females (2009 - 2010)	135 (123-148)	126 (115-140)	216 (199-242)	371 (329-421)	526 (473-572)	1348

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Pyrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxypyrene (creatinine corrected) (2003 – 2010)

CAS Number 5315-79-7

Metabolite of Pyrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	81.2 (73.9-89.2)	80.9 (70.4-91.7)	146 (122-167)	247 (221-301)	372 (321-460)	623
Mexican Americans (2005 - 2006)	84.9 (76.4-94.2)	78.4 (67.7-91.2)	132 (118-145)	237 (203-287)	374 (279-482)	611
Mexican Americans (2007 - 2008)	116 (107-125)	105 (96.5-116)	173 (156-188)	296 (250-367)	501 (395-629)	531
Mexican Americans (2009 - 2010)	133 (118-150)	119 (105-140)	216 (178-266)	388 (295-527)	643 (464-1180)	566
Non-Hispanic blacks (2003 - 2004)	90.7 (77.3-106)	92.6 (76.6-106)	171 (140-211)	325 (226-433)	451 (301-680)	663
Non-Hispanic blacks (2005 - 2006)	81.2 (70.7-93.2)	74.9 (65.6-84.8)	140 (113-173)	295 (206-403)	477 (324-643)	653
Non-Hispanic blacks (2007 - 2008)	106 (93.1-121)	104 (93.4-123)	201 (162-249)	352 (302-464)	537 (384-662)	592
Non-Hispanic blacks (2009 - 2010)	120 (109-131)	115 (103-123)	206 (185-226)	390 (323-476)	567 (471-757)	516
Non-Hispanic whites (2003 - 2004)	83.1 (75.1-91.9)	76.3 (69.0-86.6)	146 (127-174)	285 (238-360)	438 (360-506)	1040
Non-Hispanic whites (2005 - 2006)	99.3 (91.2-108)	90.6 (82.2-99.5)	188 (169-200)	358 (305-395)	495 (427-555)	968
Non-Hispanic whites (2007 - 2008)	120 (108-134)	113 (97.7-135)	206 (178-237)	379 (300-438)	510 (438-617)	1059
Non-Hispanic whites (2009 - 2010)	122 (111-133)	116 (107-126)	197 (174-222)	357 (326-393)	511 (446-569)	1203

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Pyrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxypyrene (creatinine corrected) (2011 – 2014)

CAS Number 5315-79-7

Metabolite of Pyrene

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	127 (119-137)	119 (110-128)	215 (193-241)	395 (356-449)	542 (464-703)	2485
Total population (2013 - 2014)	153 (145-162)	146 (137-155)	245 (226-263)	400 (377-441)	549 (503-570)	2649
Age 6-11 years (2011 - 2012)	187 (165-212)	181 (153-213)	276 (232-317)	415 (356-477)	500 (450-671)	396
Age 6-11 years (2013 - 2014)	197 (175-222)	190 (160-236)	303 (261-345)	443 (374-491)	538 (456-654)	399
Age 12-19 years (2011 - 2012)	126 (110-144)	121 (102-143)	194 (156-256)	313 (252-396)	409 (325-480)	387
Age 12-19 years (2013 - 2014)	145 (131-159)	140 (114-152)	215 (177-245)	378 (253-550)	550 (380-571)	449
Age 20+ years (2011 - 2012)	122 (114-131)	112 (103-122)	207 (189-227)	411 (356-464)	589 (466-793)	1702
Age 20+ years (2013 - 2014)	150 (142-159)	143 (132-154)	243 (225-263)	399 (379-440)	543 (503-593)	1801
Males (2011 - 2012)	114 (103-127)	106 (95.0-115)	196 (170-230)	378 (296-452)	506 (394-804)	1254
Males (2013 - 2014)	135 (126-144)	128 (117-138)	222 (198-238)	372 (344-405)	520 (476-570)	1314
Females (2011 - 2012)	141 (130-154)	133 (124-143)	232 (209-262)	422 (364-464)	589 (464-748)	1231
Females (2013 - 2014)	173 (161-185)	165 (151-182)	263 (242-291)	422 (380-484)	554 (491-625)	1335
Mexican Americans (2011 - 2012)	143 (123-166)	136 (116-153)	225 (176-270)	385 (267-525)	512 (374-829)	316
Mexican Americans (2013 - 2014)	143 (131-156)	136 (119-155)	212 (188-249)	327 (271-413)	447 (337-549)	450
Non-Hispanic blacks (2011 - 2012)	109 (94.8-126)	114 (95.2-138)	191 (166-233)	330 (276-396)	453 (411-556)	662
Non-Hispanic blacks (2013 - 2014)	139 (125-156)	138 (115-157)	236 (200-287)	411 (354-479)	531 (493-634)	578
Non-Hispanic whites (2011 - 2012)	127 (117-138)	113 (104-126)	218 (192-249)	415 (356-465)	580 (464-793)	810
Non-Hispanic whites (2013 - 2014)	158 (147-170)	150 (137-166)	257 (230-283)	422 (386-469)	554 (507-601)	978
All Hispanics (2011 - 2012)	147 (133-162)	144 (127-158)	244 (200-262)	395 (295-458)	525 (436-600)	572
All Hispanics (2013 - 2014)	144 (134-155)	138 (127-151)	219 (198-249)	345 (298-406)	452 (379-517)	698
Asians (2011 - 2012)	115 (101-130)	113 (96.3-131)	173 (156-191)	263 (228-326)	437 (303-601)	352
Asians (2013 - 2014)	146 (132-162)	143 (116-165)	219 (189-261)	354 (293-450)	495 (390-618)	291

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Pyrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxynaphthalene (1-Naphthol) (2003 – 2010)

CAS Number 90-15-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	2.68 (2.36-3.05)	2.26 (1.98-2.65)	7.66 (6.27-9.42)	18.5 (15.5-20.9)	26.1 (23.0-33.6)	2595
Total population (2005 - 2006)	2.64 (2.39-2.92)	1.94 (1.69-2.24)	8.45 (7.05-9.98)	29.9 (23.2-37.1)	48.1 (41.3-65.6)	2385
Total population (2007 - 2008)	2.58 (2.19-3.03)	1.98 (1.75-2.28)	6.87 (5.00-8.76)	17.2 (13.0-22.2)	29.2 (22.2-41.1)	2496
Total population (2009 - 2010)	2.05 (1.88-2.25)	1.74 (1.57-1.91)	5.19 (4.29-6.20)	14.2 (12.1-16.7)	23.9 (20.9-27.6)	2747
Age 6-11 years (2003 - 2004)	1.54 (1.36-1.75)	1.33 (1.11-1.68)	2.79 (2.18-3.52)	5.78 (4.11-8.20)	10.5 (5.87-17.0)	340
Age 6-11 years (2005 - 2006)	1.19 (1.01-1.40)	1.03 (.775-1.29)	2.16 (1.70-2.73)	8.10 (3.87-10.7)	11.0 (7.29-44.1)	336
Age 6-11 years (2007 - 2008)	1.54 (1.28-1.85)	1.50 (1.22-1.68)	3.09 (2.17-3.80)	5.94 (4.16-9.29)	9.36 (4.68-14.3)	370
Age 6-11 years (2009 - 2010)	1.17 (1.03-1.34)	1.10 (.869-1.27)	2.31 (1.85-2.56)	5.38 (2.93-7.30)	7.77 (5.40-11.4)	416
Age 12-19 years (2003 - 2004)	1.96 (1.68-2.28)	1.67 (1.50-1.97)	4.19 (3.10-5.40)	10.5 (8.43-14.3)	20.9 (13.5-26.1)	727
Age 12-19 years (2005 - 2006)	1.71 (1.49-1.96)	1.36 (1.11-1.70)	3.76 (3.11-4.37)	14.1 (9.09-23.5)	25.8 (12.4-46.2)	655
Age 12-19 years (2007 - 2008)	1.84 (1.49-2.26)	1.51 (1.19-2.01)	4.03 (2.55-5.75)	10.0 (6.70-13.5)	14.8 (12.0-21.3)	386
Age 12-19 years (2009 - 2010)	1.59 (1.18-2.15)	1.28 (.943-2.12)	3.94 (2.39-5.58)	9.24 (5.98-14.9)	17.0 (11.3-21.5)	420
Age 20+ years (2003 - 2004)	3.02 (2.58-3.52)	2.65 (2.20-3.20)	9.42 (7.32-11.5)	20.6 (16.5-23.4)	29.4 (23.4-37.4)	1528
Age 20+ years (2005 - 2006)	3.10 (2.74-3.51)	2.33 (2.03-2.82)	10.5 (8.18-13.3)	34.5 (26.7-43.4)	55.1 (42.2-80.4)	1394
Age 20+ years (2007 - 2008)	2.88 (2.37-3.49)	2.27 (1.83-2.80)	8.19 (6.01-10.7)	19.6 (15.0-25.5)	33.0 (23.6-54.9)	1740
Age 20+ years (2009 - 2010)	2.27 (2.05-2.52)	1.91 (1.66-2.14)	6.19 (4.84-7.25)	16.1 (13.2-18.6)	26.3 (21.9-30.7)	1911
Males (2003 - 2004)	3.17 (2.82-3.56)	2.84 (2.37-3.39)	8.79 (7.13-11.0)	19.6 (16.1-22.2)	25.8 (22.5-30.6)	1243
Males (2005 - 2006)	2.97 (2.63-3.35)	2.37 (1.98-2.97)	8.76 (7.14-10.7)	28.9 (21.7-33.0)	44.1 (36.0-52.3)	1197
Males (2007 - 2008)	2.94 (2.58-3.36)	2.37 (2.05-2.93)	7.75 (5.87-9.83)	15.9 (13.8-21.3)	28.2 (21.4-36.8)	1239
Males (2009 - 2010)	2.30 (2.03-2.61)	1.93 (1.63-2.20)	6.32 (4.32-7.67)	15.3 (12.8-17.8)	23.9 (21.6-27.6)	1399
Females (2003 - 2004)	2.29 (1.94-2.72)	1.85 (1.50-2.31)	6.38 (4.45-8.81)	17.9 (14.0-21.5)	28.5 (21.5-37.4)	1352
Females (2005 - 2006)	2.36 (2.01-2.77)	1.59 (1.42-1.82)	7.35 (5.57-10.2)	33.6 (21.6-43.9)	56.8 (41.6-101)	1188
Females (2007 - 2008)	2.27 (1.85-2.79)	1.58 (1.32-1.97)	5.26 (4.03-7.73)	17.7 (11.9-24.8)	32.0 (21.3-78.9)	1257
Females (2009 - 2010)	1.84 (1.60-2.12)	1.56 (1.39-1.72)	4.50 (3.65-5.34)	12.6 (10.2-16.6)	24.0 (17.7-31.5)	1348

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.047, 0.048, 0.045, and 0.044 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxynaphthalene (1-Naphthol) (2003 – 2010)

CAS Number 90-15-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	1.95 (1.73-2.19)	1.65 (1.37-2.04)	4.38 (3.52-5.30)	11.6 (9.04-15.5)	20.1 (14.9-22.5)	651
Mexican Americans (2005 - 2006)	1.54 (1.30-1.83)	1.29 (1.09-1.55)	3.72 (2.68-4.43)	11.8 (8.10-15.6)	22.2 (15.2-34.0)	607
Mexican Americans (2007 - 2008)	1.61 (1.38-1.89)	1.48 (1.23-1.66)	3.38 (2.58-4.04)	8.75 (6.12-11.9)	16.1 (8.19-29.4)	506
Mexican Americans (2009 - 2010)	1.71 (1.43-2.04)	1.50 (1.36-1.80)	3.38 (2.55-5.27)	10.7 (6.93-14.3)	17.6 (13.7-23.3)	566
Non-Hispanic blacks (2003 - 2004)	3.36 (2.80-4.02)	2.65 (2.17-3.46)	7.80 (6.52-10.8)	21.9 (17.0-29.2)	35.4 (27.0-48.9)	677
Non-Hispanic blacks (2005 - 2006)	3.42 (2.83-4.14)	2.67 (2.20-3.43)	11.9 (9.12-14.6)	29.9 (24.4-41.0)	56.4 (42.8-71.6)	641
Non-Hispanic blacks (2007 - 2008)	2.88 (2.48-3.35)	2.41 (2.12-2.91)	8.15 (5.31-10.7)	19.3 (13.7-27.1)	31.6 (21.3-42.4)	574
Non-Hispanic blacks (2009 - 2010)	3.06 (2.58-3.64)	3.04 (2.38-3.49)	9.21 (7.41-10.3)	19.3 (15.7-23.2)	29.6 (24.2-38.8)	517
Non-Hispanic whites (2003 - 2004)	2.78 (2.40-3.22)	2.29 (1.93-2.81)	8.63 (6.65-10.8)	19.8 (15.9-22.5)	27.1 (23.2-35.1)	1074
Non-Hispanic whites (2005 - 2006)	2.72 (2.30-3.21)	1.98 (1.56-2.43)	8.66 (6.73-11.3)	32.5 (22.6-42.2)	51.3 (41.0-85.5)	952
Non-Hispanic whites (2007 - 2008)	2.79 (2.23-3.50)	2.08 (1.74-2.69)	7.52 (4.97-10.4)	18.7 (12.6-26.9)	32.2 (22.5-62.0)	1022
Non-Hispanic whites (2009 - 2010)	2.00 (1.78-2.26)	1.70 (1.49-1.94)	4.77 (3.97-5.70)	13.2 (10.3-17.7)	23.9 (19.5-30.8)	1203

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08 and 09-10 are 0.047, 0.048, 0.045, and 0.044 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxynaphthalene (1-Naphthol) (2011 – 2014)

CAS Number 90-15-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.67 (1.52-1.84)	1.41 (1.26-1.59)	3.90 (3.25-5.05)	13.1 (10.9-15.7)	22.1 (19.0-26.6)	2492
Total population (2013 - 2014)	1.52 (1.37-1.68)	1.16 (1.03-1.28)	3.25 (2.92-3.82)	11.7 (9.55-15.2)	21.3 (17.1-28.7)	2640
Age 6-11 years (2011 - 2012)	.960 (.803-1.15)	.970 (.727-1.20)	2.01 (1.63-2.51)	4.02 (3.11-7.07)	7.99 (5.05-12.6)	397
Age 6-11 years (2013 - 2014)	.798 (.694-.917)	.678 (.595-.848)	1.44 (1.21-1.70)	2.98 (2.32-4.05)	5.12 (3.64-9.16)	399
Age 12-19 years (2011 - 2012)	1.16 (.895-1.50)	1.04 (.843-1.33)	2.34 (1.77-3.34)	8.38 (3.43-15.0)	14.6 (8.38-22.4)	389
Age 12-19 years (2013 - 2014)	1.06 (.900-1.26)	.894 (.760-1.02)	1.79 (1.43-2.52)	6.62 (3.54-10.4)	10.5 (7.62-18.2)	449
Age 20+ years (2011 - 2012)	1.88 (1.71-2.06)	1.59 (1.40-1.73)	5.05 (3.98-5.82)	14.7 (12.4-17.9)	23.7 (19.8-34.2)	1706
Age 20+ years (2013 - 2014)	1.71 (1.52-1.92)	1.29 (1.16-1.44)	3.98 (3.33-4.66)	13.9 (10.9-18.0)	25.4 (18.8-32.6)	1792
Males (2011 - 2012)	1.89 (1.66-2.15)	1.62 (1.36-1.78)	4.57 (3.25-5.91)	13.5 (10.6-19.0)	22.9 (16.7-36.7)	1258
Males (2013 - 2014)	1.69 (1.46-1.96)	1.30 (1.19-1.50)	3.37 (2.92-4.31)	12.0 (8.42-17.4)	22.3 (13.8-36.5)	1312
Females (2011 - 2012)	1.49 (1.20-1.84)	1.21 (.997-1.52)	3.51 (2.67-5.12)	12.9 (8.54-16.4)	21.1 (17.7-24.6)	1234
Females (2013 - 2014)	1.36 (1.23-1.51)	.989 (.882-1.13)	3.00 (2.30-3.82)	11.0 (9.19-15.1)	20.9 (16.5-27.4)	1328
Mexican Americans (2011 - 2012)	1.27 (.962-1.68)	1.15 (.805-1.46)	2.92 (1.79-4.58)	7.97 (4.82-13.3)	14.2 (7.97-20.2)	317
Mexican Americans (2013 - 2014)	.960 (.884-1.04)	.823 (.726-.929)	1.83 (1.44-1.99)	4.12 (2.75-7.50)	9.47 (5.22-15.7)	450
Non-Hispanic blacks (2011 - 2012)	2.14 (1.85-2.47)	1.78 (1.51-2.01)	5.17 (3.73-6.71)	14.9 (11.2-19.5)	22.8 (16.8-42.9)	664
Non-Hispanic blacks (2013 - 2014)	2.44 (1.97-3.01)	1.75 (1.51-2.31)	6.40 (4.54-9.08)	19.2 (11.5-23.4)	30.8 (22.7-36.5)	577
Non-Hispanic whites (2011 - 2012)	1.70 (1.53-1.90)	1.47 (1.28-1.65)	4.20 (3.15-5.43)	13.6 (10.9-17.4)	22.4 (17.7-33.4)	814
Non-Hispanic whites (2013 - 2014)	1.58 (1.36-1.84)	1.16 (1.00-1.33)	3.36 (2.99-4.16)	13.1 (9.55-17.9)	25.6 (18.0-36.9)	973
All Hispanics (2011 - 2012)	1.35 (1.12-1.64)	1.13 (.896-1.41)	3.17 (2.39-4.46)	9.30 (6.34-11.6)	16.1 (11.3-20.9)	573
All Hispanics (2013 - 2014)	1.02 (.922-1.13)	.864 (.784-.940)	1.88 (1.69-2.14)	5.22 (3.21-7.86)	10.6 (6.62-13.1)	696
Asians (2011 - 2012)	1.29 (1.01-1.66)	1.16 (.885-1.50)	3.00 (2.02-4.61)	8.61 (5.33-11.5)	15.5 (10.6-21.9)	352
Asians (2013 - 2014)	1.11 (.884-1.40)	.859 (.737-1.01)	1.91 (1.29-3.71)	7.99 (3.48-19.5)	19.5 (6.51-38.6)	290

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.044 and 0.06, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxynaphthalene (1-Naphthol) (creatinine corrected) (2003 – 2010)

CAS Number 90-15-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	2.52 (2.28-2.79)	2.10 (1.87-2.40)	6.56 (5.43-8.18)	15.1 (13.5-17.4)	21.8 (18.2-25.4)	2595
Total population (2005 - 2006)	2.56 (2.29-2.86)	1.79 (1.57-2.06)	7.57 (5.89-9.40)	24.7 (20.4-31.0)	39.6 (34.1-53.0)	2385
Total population (2007 - 2008)	2.59 (2.19-3.06)	1.98 (1.67-2.40)	6.25 (4.69-8.22)	16.1 (13.6-18.8)	25.3 (20.9-32.8)	2496
Total population (2009 - 2010)	2.14 (1.99-2.32)	1.69 (1.59-1.86)	4.68 (4.21-5.52)	13.5 (12.3-14.9)	21.2 (19.0-22.9)	2747
Age 6-11 years (2003 - 2004)	1.63 (1.43-1.86)	1.36 (1.18-1.74)	2.77 (2.27-3.20)	5.70 (3.99-8.95)	10.2 (5.70-16.4)	340
Age 6-11 years (2005 - 2006)	1.30 (1.09-1.55)	1.09 (.938-1.33)	2.21 (1.99-2.81)	6.15 (3.33-10.3)	10.3 (6.82-28.0)	336
Age 6-11 years (2007 - 2008)	1.87 (1.57-2.24)	1.67 (1.35-2.15)	3.31 (2.61-4.65)	7.37 (5.13-8.83)	9.99 (8.06-11.3)	370
Age 6-11 years (2009 - 2010)	1.53 (1.35-1.73)	1.39 (1.17-1.63)	2.66 (2.36-2.95)	5.58 (4.36-7.62)	9.32 (5.73-17.2)	416
Age 12-19 years (2003 - 2004)	1.47 (1.26-1.71)	1.20 (1.02-1.39)	2.84 (2.49-4.08)	7.56 (5.47-9.12)	10.8 (9.12-13.4)	727
Age 12-19 years (2005 - 2006)	1.29 (1.14-1.45)	.995 (.854-1.10)	2.70 (2.27-3.35)	8.76 (5.83-10.8)	12.5 (9.37-19.6)	655
Age 12-19 years (2007 - 2008)	1.39 (1.18-1.65)	1.13 (.833-1.58)	3.21 (2.02-3.63)	6.95 (4.79-8.41)	9.93 (7.84-11.9)	386
Age 12-19 years (2009 - 2010)	1.28 (1.03-1.60)	.992 (.735-1.36)	2.54 (1.87-3.77)	7.54 (4.63-9.68)	10.5 (7.54-17.5)	420
Age 20+ years (2003 - 2004)	2.90 (2.59-3.25)	2.52 (2.12-3.06)	8.21 (6.45-9.81)	16.9 (14.4-19.8)	24.2 (20.0-27.2)	1528
Age 20+ years (2005 - 2006)	3.08 (2.72-3.50)	2.32 (1.91-2.73)	10.1 (7.67-13.9)	29.8 (23.9-34.1)	46.4 (39.1-57.3)	1394
Age 20+ years (2007 - 2008)	2.96 (2.43-3.60)	2.36 (1.89-2.78)	7.42 (5.75-10.2)	18.5 (14.9-22.6)	27.9 (22.3-45.0)	1740
Age 20+ years (2009 - 2010)	2.41 (2.21-2.63)	1.92 (1.71-2.10)	5.83 (4.84-6.84)	15.4 (13.5-16.7)	22.7 (20.2-27.0)	1911
Males (2003 - 2004)	2.49 (2.25-2.75)	2.14 (1.86-2.59)	6.56 (5.50-8.01)	13.5 (12.3-14.4)	18.3 (16.6-20.7)	1243
Males (2005 - 2006)	2.38 (2.11-2.68)	1.89 (1.59-2.21)	6.45 (4.94-9.21)	19.2 (16.1-22.4)	31.7 (22.1-38.4)	1197
Males (2007 - 2008)	2.48 (2.21-2.77)	2.07 (1.74-2.39)	6.17 (5.07-7.52)	13.8 (11.9-16.0)	20.7 (16.7-24.0)	1239
Males (2009 - 2010)	2.07 (1.82-2.35)	1.67 (1.48-1.94)	5.07 (3.82-6.48)	12.6 (10.4-14.9)	18.6 (15.3-21.9)	1399
Females (2003 - 2004)	2.56 (2.22-2.95)	2.04 (1.73-2.44)	6.68 (5.00-8.85)	17.5 (13.5-21.7)	24.7 (19.8-30.6)	1352
Females (2005 - 2006)	2.75 (2.37-3.19)	1.75 (1.47-2.06)	8.05 (6.08-11.8)	31.5 (24.7-39.5)	54.2 (40.8-64.5)	1188
Females (2007 - 2008)	2.71 (2.13-3.43)	1.94 (1.58-2.50)	6.31 (4.29-9.32)	18.9 (13.8-23.7)	32.8 (22.3-104)	1257
Females (2009 - 2010)	2.22 (1.95-2.53)	1.71 (1.59-1.89)	4.54 (3.89-5.49)	15.4 (10.8-19.6)	24.7 (18.6-31.1)	1348

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxynaphthalene (1-Naphthol) (creatinine corrected) (2003 – 2010)

CAS Number 90-15-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2003 - 2004)	1.75 (1.59-1.93)	1.50 (1.26-1.69)	3.24 (2.90-4.25)	8.55 (7.15-12.0)	17.5 (13.5-21.4)	651
Mexican Americans (2005 - 2006)	1.37 (1.15-1.64)	1.08 (.940-1.38)	2.83 (2.13-3.82)	9.50 (5.95-12.6)	18.8 (12.0-21.6)	607
Mexican Americans (2007 - 2008)	1.59 (1.29-1.95)	1.29 (1.03-1.57)	3.09 (2.17-5.05)	7.58 (5.43-10.8)	11.8 (7.86-26.1)	506
Mexican Americans (2009 - 2010)	1.70 (1.46-1.98)	1.41 (1.24-1.61)	3.38 (2.48-4.56)	7.83 (6.02-11.6)	15.7 (10.9-19.3)	566
Non-Hispanic blacks (2003 - 2004)	2.36 (2.03-2.76)	2.00 (1.59-2.41)	5.90 (4.44-6.81)	13.8 (9.01-18.7)	20.9 (17.1-30.3)	677
Non-Hispanic blacks (2005 - 2006)	2.40 (1.99-2.89)	1.98 (1.52-2.51)	7.17 (5.28-8.85)	20.6 (15.4-29.2)	39.2 (29.2-54.3)	641
Non-Hispanic blacks (2007 - 2008)	2.22 (1.87-2.64)	1.87 (1.47-2.42)	6.06 (4.34-7.94)	13.6 (10.6-17.0)	21.3 (14.1-31.8)	574
Non-Hispanic blacks (2009 - 2010)	2.22 (1.96-2.52)	2.13 (1.64-2.52)	5.89 (4.70-7.22)	13.0 (10.3-14.9)	18.2 (14.5-28.9)	517
Non-Hispanic whites (2003 - 2004)	2.75 (2.45-3.08)	2.33 (1.94-2.87)	8.03 (6.32-9.26)	16.6 (14.4-18.9)	23.5 (20.3-26.0)	1074
Non-Hispanic whites (2005 - 2006)	2.84 (2.41-3.36)	1.99 (1.60-2.54)	8.65 (5.95-12.6)	28.2 (20.8-35.0)	43.1 (38.4-59.0)	952
Non-Hispanic whites (2007 - 2008)	2.90 (2.33-3.61)	2.16 (1.71-2.78)	7.30 (5.00-10.2)	18.4 (14.8-22.3)	27.3 (22.3-50.8)	1022
Non-Hispanic whites (2009 - 2010)	2.25 (2.05-2.48)	1.74 (1.59-1.92)	4.84 (4.08-5.98)	14.6 (12.8-16.9)	22.5 (19.1-27.1)	1203

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 1-Hydroxynaphthalene (1-Naphthol) (creatinine corrected) (2011 – 2014)

CAS Number 90-15-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	1.90 (1.73-2.10)	1.51 (1.35-1.67)	4.15 (3.49-5.23)	13.4 (10.4-15.6)	20.4 (15.8-26.7)	2490
Total population (2013 - 2014)	1.76 (1.61-1.93)	1.28 (1.20-1.35)	3.42 (2.94-4.02)	11.5 (9.43-14.2)	20.8 (18.3-23.9)	2639
Age 6-11 years (2011 - 2012)	1.38 (1.18-1.61)	1.21 (.971-1.58)	2.36 (1.96-2.83)	4.78 (3.72-6.59)	8.90 (5.68-10.0)	396
Age 6-11 years (2013 - 2014)	1.20 (1.07-1.34)	1.00 (.892-1.21)	1.83 (1.56-2.28)	3.40 (2.46-5.64)	6.63 (4.14-9.10)	399
Age 12-19 years (2011 - 2012)	1.12 (.927-1.35)	.936 (.729-1.21)	2.02 (1.43-3.03)	5.22 (3.42-7.72)	8.11 (5.61-17.2)	389
Age 12-19 years (2013 - 2014)	.964 (.859-1.08)	.792 (.642-.926)	1.32 (1.12-1.72)	4.46 (2.85-7.92)	8.98 (4.46-19.0)	449
Age 20+ years (2011 - 2012)	2.14 (1.93-2.36)	1.69 (1.49-1.87)	5.35 (4.44-6.53)	15.3 (13.0-17.5)	22.4 (16.4-38.0)	1705
Age 20+ years (2013 - 2014)	2.00 (1.82-2.21)	1.45 (1.33-1.57)	4.31 (3.68-5.10)	13.6 (10.9-16.6)	23.9 (19.3-26.8)	1791
Males (2011 - 2012)	1.77 (1.53-2.05)	1.43 (1.16-1.69)	3.80 (2.92-5.93)	12.2 (9.34-14.7)	18.8 (14.2-25.5)	1257
Males (2013 - 2014)	1.70 (1.46-1.98)	1.23 (1.07-1.37)	3.36 (2.63-4.21)	10.5 (7.22-16.0)	19.9 (13.5-25.0)	1311
Females (2011 - 2012)	2.04 (1.68-2.47)	1.62 (1.30-1.90)	4.42 (3.31-6.05)	15.3 (12.4-18.0)	21.6 (18.0-30.0)	1233
Females (2013 - 2014)	1.82 (1.66-2.00)	1.33 (1.23-1.41)	3.59 (2.65-4.57)	13.0 (10.2-15.4)	22.7 (18.6-26.6)	1328
Mexican Americans (2011 - 2012)	1.43 (1.14-1.80)	1.18 (.841-1.71)	3.03 (1.94-4.75)	7.88 (5.68-10.6)	11.8 (8.45-18.9)	317
Mexican Americans (2013 - 2014)	1.10 (.989-1.22)	.927 (.823-1.06)	1.82 (1.52-2.28)	4.38 (3.41-5.85)	8.82 (5.13-13.0)	450
Non-Hispanic blacks (2011 - 2012)	1.66 (1.46-1.90)	1.29 (1.11-1.47)	4.01 (3.05-5.22)	10.5 (8.56-12.7)	16.4 (12.2-25.5)	664
Non-Hispanic blacks (2013 - 2014)	1.86 (1.58-2.19)	1.35 (1.12-1.76)	4.86 (3.53-6.19)	12.3 (10.2-14.4)	17.1 (14.0-19.3)	577
Non-Hispanic whites (2011 - 2012)	2.07 (1.87-2.30)	1.66 (1.47-1.81)	4.97 (3.58-6.10)	15.0 (12.7-17.5)	22.4 (15.8-39.3)	812
Non-Hispanic whites (2013 - 2014)	1.96 (1.71-2.24)	1.38 (1.26-1.56)	3.87 (3.02-5.20)	13.8 (9.28-18.8)	23.9 (19.0-31.0)	972
All Hispanics (2011 - 2012)	1.51 (1.27-1.81)	1.21 (.961-1.59)	3.35 (2.33-4.61)	9.08 (6.82-11.3)	15.1 (10.7-20.1)	573
All Hispanics (2013 - 2014)	1.14 (1.02-1.28)	.948 (.878-1.05)	1.75 (1.52-2.20)	4.83 (3.41-7.65)	9.16 (5.97-15.2)	696
Asians (2011 - 2012)	1.73 (1.37-2.20)	1.31 (1.00-1.72)	3.74 (2.64-4.72)	8.92 (6.47-14.1)	22.8 (9.03-56.6)	352
Asians (2013 - 2014)	1.74 (1.40-2.18)	1.27 (1.02-1.63)	3.62 (2.09-5.47)	7.95 (5.10-24.2)	24.2 (7.39-37.0)	290

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxynaphthalene (2-Naphthol) (2001 – 2010)

CAS Number 135-19-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	2.47 (2.11-2.89)	2.28 (1.93-2.67)	5.68 (4.58-6.83)	14.7 (12.8-19.5)	26.0 (22.5-29.7)	2748
Total population (2003 - 2004)	3.18 (2.76-3.67)	2.96 (2.50-3.50)	7.50 (6.19-9.69)	17.3 (14.5-22.1)	25.8 (22.6-27.7)	2575
Total population (2005 - 2006)	3.63 (3.36-3.92)	3.44 (3.11-3.80)	8.55 (7.84-9.42)	20.2 (17.0-24.1)	33.1 (28.6-38.2)	2446
Total population (2007 - 2008)	3.83 (3.37-4.36)	3.66 (3.24-4.12)	8.44 (6.67-10.3)	17.3 (14.8-21.9)	26.7 (23.0-30.8)	2531
Total population (2009 - 2010)	3.55 (3.23-3.91)	3.49 (3.15-3.85)	7.81 (7.07-8.55)	15.8 (14.0-17.6)	23.8 (21.5-26.9)	2747
Age 6-11 years (2001 - 2002)	1.69 (1.56-1.84)	1.70 (1.40-1.95)	3.01 (2.58-3.47)	5.41 (3.89-6.70)	7.72 (6.30-9.54)	387
Age 6-11 years (2003 - 2004)	2.11 (1.80-2.47)	2.14 (1.79-2.59)	3.57 (3.14-4.38)	5.58 (5.05-6.38)	9.71 (5.23-20.0)	339
Age 6-11 years (2005 - 2006)	2.16 (1.94-2.41)	2.09 (1.95-2.33)	3.96 (3.09-4.46)	5.64 (5.00-9.68)	10.6 (7.21-13.3)	345
Age 6-11 years (2007 - 2008)	2.70 (2.38-3.06)	2.59 (2.13-2.95)	4.66 (4.05-5.23)	8.73 (5.91-10.7)	11.5 (9.16-14.8)	376
Age 6-11 years (2009 - 2010)	2.40 (2.04-2.83)	2.49 (2.12-3.02)	4.89 (3.80-6.27)	9.61 (7.65-11.6)	12.8 (10.4-22.2)	416
Age 12-19 years (2001 - 2002)	2.22 (1.70-2.90)	2.15 (1.74-2.53)	4.39 (3.15-6.11)	11.0 (6.99-20.4)	22.5 (13.9-28.4)	735
Age 12-19 years (2003 - 2004)	3.04 (2.68-3.46)	2.91 (2.51-3.50)	5.29 (4.67-6.59)	12.4 (8.53-16.8)	17.6 (15.1-25.9)	721
Age 12-19 years (2005 - 2006)	3.46 (3.04-3.95)	3.30 (2.87-3.78)	6.75 (5.87-7.49)	14.5 (10.3-20.8)	23.9 (14.7-33.1)	677
Age 12-19 years (2007 - 2008)	4.29 (3.49-5.28)	4.34 (3.73-5.32)	8.74 (6.57-10.8)	17.1 (13.0-22.5)	24.0 (19.6-29.7)	387
Age 12-19 years (2009 - 2010)	3.93 (3.25-4.75)	3.98 (3.37-5.26)	7.76 (6.63-9.35)	12.8 (10.7-16.0)	19.8 (13.4-22.1)	420
Age 20+ years (2001 - 2002)	2.62 (2.22-3.10)	2.44 (1.94-2.95)	6.38 (5.11-8.11)	17.6 (14.0-21.1)	28.1 (23.3-33.7)	1626
Age 20+ years (2003 - 2004)	3.37 (2.86-3.96)	3.18 (2.59-3.96)	8.77 (7.21-11.3)	19.2 (16.0-23.2)	26.6 (23.4-28.8)	1515
Age 20+ years (2005 - 2006)	3.88 (3.51-4.29)	3.77 (3.25-4.33)	9.58 (8.77-10.6)	23.0 (18.6-28.8)	37.0 (29.2-39.5)	1424
Age 20+ years (2007 - 2008)	3.91 (3.41-4.50)	3.68 (3.20-4.32)	9.17 (6.82-11.0)	18.5 (15.1-23.6)	28.6 (23.8-33.5)	1768
Age 20+ years (2009 - 2010)	3.66 (3.27-4.08)	3.54 (3.14-4.00)	8.17 (7.41-9.09)	17.4 (15.0-19.7)	25.6 (22.1-32.1)	1911
Males (2001 - 2002)	2.75 (2.36-3.22)	2.51 (2.09-2.97)	6.06 (4.82-7.81)	16.9 (11.9-23.0)	28.1 (20.8-35.6)	1349
Males (2003 - 2004)	3.52 (3.09-4.01)	3.37 (2.91-3.88)	8.52 (6.96-10.5)	18.4 (15.3-22.6)	26.1 (22.2-27.9)	1233
Males (2005 - 2006)	4.03 (3.65-4.44)	3.85 (3.25-4.34)	9.49 (7.84-11.3)	19.7 (16.7-23.1)	32.9 (25.5-38.2)	1221
Males (2007 - 2008)	4.25 (3.77-4.78)	4.20 (3.74-4.52)	9.30 (7.35-10.8)	17.5 (14.5-22.7)	26.0 (20.9-32.6)	1256
Males (2009 - 2010)	3.72 (3.30-4.20)	3.52 (3.14-4.12)	7.43 (6.76-8.41)	15.5 (13.7-18.0)	25.2 (21.0-27.2)	1399
Females (2001 - 2002)	2.22 (1.86-2.66)	2.06 (1.65-2.48)	5.24 (3.89-6.44)	13.9 (12.3-17.7)	25.3 (19.7-28.3)	1399
Females (2003 - 2004)	2.89 (2.42-3.45)	2.60 (2.14-3.16)	6.80 (5.14-9.21)	16.6 (12.7-21.3)	23.9 (22.1-27.6)	1342
Females (2005 - 2006)	3.28 (2.83-3.80)	3.18 (2.64-3.61)	7.83 (6.77-9.00)	21.3 (14.5-29.2)	35.0 (26.7-39.6)	1225
Females (2007 - 2008)	3.47 (2.99-4.03)	3.18 (2.65-3.74)	7.64 (5.97-10.0)	17.1 (13.6-21.9)	26.7 (21.6-30.8)	1275
Females (2009 - 2010)	3.40 (3.09-3.74)	3.44 (3.07-3.82)	8.14 (7.12-9.07)	16.3 (13.6-18.6)	23.7 (20.8-30.7)	1348

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.002, 0.031, 0.013, 0.042, and 0.042 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxynaphthalene (2-Naphthol) (2001 – 2010)

CAS Number 135-19-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	2.70 (2.36-3.08)	2.71 (2.35-3.26)	5.14 (4.36-6.15)	9.64 (8.15-10.6)	14.3 (10.4-18.7)	665
Mexican Americans (2003 - 2004)	3.13 (2.71-3.63)	3.11 (2.57-3.85)	6.74 (5.60-8.28)	14.5 (10.4-15.6)	18.0 (15.5-20.5)	648
Mexican Americans (2005 - 2006)	4.52 (4.12-4.96)	4.79 (4.13-5.43)	8.96 (7.84-9.81)	17.3 (12.4-23.3)	28.7 (20.0-32.7)	621
Mexican Americans (2007 - 2008)	4.69 (4.07-5.41)	4.50 (3.93-5.58)	8.60 (6.77-11.3)	16.4 (12.6-20.9)	24.0 (19.1-29.7)	515
Mexican Americans (2009 - 2010)	4.47 (3.90-5.13)	4.56 (3.72-5.88)	9.63 (8.51-10.7)	16.6 (13.4-19.5)	23.6 (18.7-28.4)	566
Non-Hispanic blacks (2001 - 2002)	3.97 (3.47-4.54)	3.46 (3.10-4.02)	9.29 (6.82-13.2)	22.8 (16.0-29.1)	33.0 (25.9-38.7)	692
Non-Hispanic blacks (2003 - 2004)	4.69 (3.81-5.77)	4.23 (3.18-5.54)	10.3 (7.67-13.1)	21.5 (17.4-26.1)	30.7 (23.0-40.6)	673
Non-Hispanic blacks (2005 - 2006)	4.99 (4.41-5.65)	4.63 (3.93-5.62)	11.6 (9.37-14.3)	22.6 (20.0-26.9)	31.9 (27.6-38.5)	657
Non-Hispanic blacks (2007 - 2008)	4.90 (4.42-5.44)	4.81 (4.33-5.19)	10.1 (8.05-12.3)	22.1 (17.2-26.3)	28.6 (25.0-36.6)	587
Non-Hispanic blacks (2009 - 2010)	5.23 (4.45-6.16)	5.42 (4.51-6.80)	11.1 (9.18-13.3)	22.1 (17.9-26.0)	30.9 (26.0-35.1)	517
Non-Hispanic whites (2001 - 2002)	2.19 (1.76-2.72)	1.91 (1.61-2.42)	4.97 (3.71-6.78)	14.1 (10.7-20.2)	25.9 (20.7-30.0)	1207
Non-Hispanic whites (2003 - 2004)	3.07 (2.57-3.66)	2.65 (2.19-3.43)	7.61 (5.77-10.3)	18.5 (14.5-23.2)	26.3 (23.2-28.7)	1062
Non-Hispanic whites (2005 - 2006)	3.25 (2.90-3.64)	2.98 (2.71-3.33)	7.90 (6.69-9.36)	19.3 (15.8-24.7)	34.0 (25.5-38.3)	980
Non-Hispanic whites (2007 - 2008)	3.60 (2.98-4.35)	3.34 (2.61-4.17)	8.04 (5.73-10.7)	17.1 (11.8-23.8)	26.4 (20.4-35.6)	1044
Non-Hispanic whites (2009 - 2010)	3.17 (2.79-3.62)	3.12 (2.81-3.51)	6.75 (6.06-7.81)	14.1 (12.3-17.6)	22.3 (19.7-26.5)	1203

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.002, 0.031, 0.013, 0.042, and 0.042 respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxynaphthalene (2-Naphthol) (2011 – 2014)

CAS Number 135-19-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	4.14 (3.73-4.61)	4.18 (3.83-4.76)	9.74 (8.22-10.8)	19.7 (17.7-21.2)	28.1 (24.1-30.3)	2492
Total population (2013 - 2014)	4.22 (3.95-4.50)	4.11 (3.67-4.61)	9.80 (9.33-10.4)	19.7 (17.9-21.6)	30.0 (28.7-31.1)	2641
Age 6-11 years (2011 - 2012)	3.13 (2.66-3.69)	3.34 (2.75-4.53)	6.49 (5.77-8.10)	11.9 (11.1-16.5)	20.3 (14.8-26.5)	397
Age 6-11 years (2013 - 2014)	3.03 (2.57-3.59)	2.97 (2.51-3.62)	5.94 (4.76-7.58)	12.9 (9.34-16.2)	18.6 (13.3-29.0)	399
Age 12-19 years (2011 - 2012)	4.33 (3.47-5.40)	4.03 (3.18-5.36)	9.34 (7.14-11.7)	20.8 (14.7-26.6)	27.3 (20.8-61.5)	389
Age 12-19 years (2013 - 2014)	5.09 (4.17-6.23)	5.41 (3.76-7.43)	10.6 (8.67-13.8)	20.6 (15.7-26.2)	28.6 (23.0-31.4)	449
Age 20+ years (2011 - 2012)	4.25 (3.78-4.77)	4.26 (3.84-4.96)	10.4 (8.45-11.4)	20.0 (17.7-22.2)	28.5 (23.6-31.2)	1706
Age 20+ years (2013 - 2014)	4.24 (3.92-4.59)	4.18 (3.56-4.80)	9.98 (9.40-10.9)	20.2 (18.4-22.6)	30.3 (28.8-33.3)	1793
Males (2011 - 2012)	4.26 (3.82-4.76)	4.20 (3.62-5.09)	8.93 (7.61-10.7)	18.3 (14.7-22.4)	27.7 (21.0-32.9)	1258
Males (2013 - 2014)	4.14 (3.71-4.61)	4.05 (3.37-4.74)	9.11 (8.45-10.2)	17.5 (15.3-22.0)	28.5 (22.2-32.8)	1310
Females (2011 - 2012)	4.03 (3.50-4.65)	4.16 (3.72-4.83)	10.4 (8.56-11.9)	20.5 (17.8-23.0)	28.3 (24.1-31.2)	1234
Females (2013 - 2014)	4.29 (3.96-4.65)	4.22 (3.81-4.73)	10.7 (9.71-12.1)	21.1 (19.0-24.2)	30.3 (27.6-35.2)	1331
Mexican Americans (2011 - 2012)	5.86 (5.13-6.70)	5.41 (4.82-6.55)	12.7 (9.57-16.6)	22.5 (17.5-25.1)	27.5 (22.7-37.3)	317
Mexican Americans (2013 - 2014)	5.36 (4.74-6.06)	5.43 (4.58-6.22)	11.0 (9.07-13.2)	17.5 (13.9-28.4)	28.4 (16.5-46.4)	449
Non-Hispanic blacks (2011 - 2012)	6.65 (5.66-7.80)	6.87 (5.70-8.56)	14.0 (11.8-15.1)	23.6 (20.3-28.4)	37.0 (25.4-47.1)	664
Non-Hispanic blacks (2013 - 2014)	7.53 (6.60-8.60)	7.74 (6.54-8.76)	14.9 (13.0-17.8)	25.7 (20.7-31.5)	34.5 (30.0-48.0)	576
Non-Hispanic whites (2011 - 2012)	3.54 (3.17-3.96)	3.59 (3.09-4.06)	7.55 (6.80-9.06)	17.8 (13.4-20.5)	26.2 (20.5-29.2)	814
Non-Hispanic whites (2013 - 2014)	3.68 (3.33-4.06)	3.39 (2.85-3.94)	9.07 (8.05-9.94)	18.6 (16.9-23.0)	30.0 (26.8-31.4)	975
All Hispanics (2011 - 2012)	5.69 (4.90-6.61)	5.49 (4.60-6.61)	12.6 (10.1-15.7)	22.8 (18.4-24.7)	27.9 (23.0-42.3)	573
All Hispanics (2013 - 2014)	5.42 (4.89-6.00)	5.44 (4.87-6.07)	11.1 (9.40-12.7)	19.4 (14.7-27.6)	28.5 (19.8-38.7)	695
Asians (2011 - 2012)	2.91 (2.37-3.56)	2.97 (2.06-3.86)	6.33 (5.29-8.33)	13.5 (10.8-17.0)	20.6 (14.2-26.6)	352
Asians (2013 - 2014)	2.60 (2.02-3.34)	2.24 (1.83-2.86)	4.90 (3.48-8.26)	12.5 (6.39-25.3)	20.2 (11.7-34.4)	291

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.042 and 0.09, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxynaphthalene (2-Naphthol) (creatinine corrected) (2001 – 2010)

CAS Number 135-19-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	2.31 (1.98-2.68)	1.94 (1.67-2.30)	4.73 (3.82-5.86)	11.5 (9.98-13.1)	16.7 (14.1-19.2)	2748
Total population (2003 - 2004)	2.99 (2.67-3.34)	2.56 (2.20-2.97)	6.34 (5.01-7.87)	14.1 (11.8-16.3)	19.9 (16.0-23.8)	2575
Total population (2005 - 2006)	3.52 (3.29-3.77)	3.08 (2.67-3.40)	7.24 (6.45-8.27)	17.0 (14.8-18.8)	23.9 (21.9-27.2)	2446
Total population (2007 - 2008)	3.86 (3.44-4.33)	3.44 (3.04-3.91)	7.08 (6.01-8.63)	15.3 (12.9-18.3)	20.7 (18.8-23.9)	2531
Total population (2009 - 2010)	3.71 (3.47-3.97)	3.33 (3.08-3.70)	6.69 (6.29-7.15)	13.8 (12.7-15.0)	19.9 (17.8-21.7)	2747
Age 6-11 years (2001 - 2002)	1.89 (1.74-2.07)	1.83 (1.72-1.94)	3.11 (2.51-3.47)	5.04 (4.38-5.54)	6.49 (5.27-12.4)	387
Age 6-11 years (2003 - 2004)	2.24 (1.89-2.65)	2.04 (1.66-2.44)	3.54 (2.85-3.91)	5.95 (4.14-8.51)	8.72 (7.56-12.0)	339
Age 6-11 years (2005 - 2006)	2.40 (2.10-2.75)	2.27 (2.00-2.58)	3.68 (3.15-4.43)	6.10 (4.84-7.04)	7.82 (6.31-13.8)	345
Age 6-11 years (2007 - 2008)	3.33 (2.98-3.73)	3.35 (2.90-3.71)	5.23 (4.32-6.78)	8.00 (6.79-9.92)	10.5 (8.00-14.5)	376
Age 6-11 years (2009 - 2010)	3.13 (2.73-3.60)	3.08 (2.54-3.60)	5.01 (4.19-6.23)	9.79 (7.04-12.5)	13.8 (10.9-18.9)	416
Age 12-19 years (2001 - 2002)	1.72 (1.35-2.19)	1.51 (1.34-1.83)	2.75 (2.08-4.07)	7.18 (4.07-10.9)	11.1 (7.86-17.4)	735
Age 12-19 years (2003 - 2004)	2.28 (2.06-2.52)	2.03 (1.77-2.35)	3.78 (3.20-4.47)	7.84 (6.13-9.11)	10.5 (9.10-12.5)	721
Age 12-19 years (2005 - 2006)	2.59 (2.37-2.84)	2.31 (2.03-2.62)	4.58 (3.99-5.02)	8.47 (6.98-10.5)	11.9 (10.1-15.2)	677
Age 12-19 years (2007 - 2008)	3.30 (2.74-3.96)	3.13 (2.43-4.08)	5.73 (4.88-6.79)	9.85 (7.56-12.0)	12.5 (9.91-18.6)	387
Age 12-19 years (2009 - 2010)	3.16 (2.79-3.58)	3.00 (2.58-3.67)	5.43 (4.70-6.35)	8.73 (7.59-9.98)	12.5 (9.61-14.2)	420
Age 20+ years (2001 - 2002)	2.48 (2.13-2.89)	2.08 (1.68-2.60)	5.63 (4.46-6.94)	12.4 (10.9-13.9)	17.7 (15.2-20.6)	1626
Age 20+ years (2003 - 2004)	3.23 (2.87-3.64)	2.91 (2.36-3.41)	7.54 (6.20-9.10)	15.6 (13.1-17.9)	21.8 (17.2-24.0)	1515
Age 20+ years (2005 - 2006)	3.87 (3.59-4.17)	3.40 (3.08-3.75)	9.20 (7.93-10.5)	19.0 (17.4-21.3)	27.2 (22.3-29.7)	1424
Age 20+ years (2007 - 2008)	4.02 (3.55-4.55)	3.47 (3.07-4.04)	7.75 (6.17-9.83)	17.5 (13.9-19.8)	22.7 (20.2-25.5)	1768
Age 20+ years (2009 - 2010)	3.87 (3.57-4.20)	3.47 (3.18-3.87)	7.26 (6.69-7.99)	14.9 (13.3-16.8)	21.2 (19.2-22.8)	1911
Males (2001 - 2002)	2.23 (1.90-2.61)	1.86 (1.63-2.10)	4.79 (3.51-6.12)	11.4 (8.95-14.3)	15.8 (13.1-19.2)	1349
Males (2003 - 2004)	2.77 (2.50-3.06)	2.36 (2.13-2.81)	6.31 (5.08-7.36)	12.8 (11.3-14.6)	16.4 (14.6-18.3)	1233
Males (2005 - 2006)	3.23 (3.00-3.48)	2.83 (2.53-3.14)	6.75 (5.62-8.10)	13.8 (12.3-16.2)	18.9 (17.4-21.3)	1221
Males (2007 - 2008)	3.58 (3.24-3.95)	3.13 (2.70-3.57)	6.79 (5.79-8.10)	14.4 (12.2-17.2)	19.6 (18.3-20.9)	1256
Males (2009 - 2010)	3.34 (3.04-3.67)	2.92 (2.54-3.37)	6.19 (5.44-6.84)	13.2 (11.1-15.4)	18.1 (14.9-21.7)	1399
Females (2001 - 2002)	2.38 (2.05-2.77)	1.99 (1.66-2.56)	4.73 (3.79-6.00)	11.5 (10.3-12.8)	17.4 (13.7-21.5)	1399
Females (2003 - 2004)	3.21 (2.76-3.73)	2.68 (2.20-3.26)	6.43 (4.74-8.58)	16.0 (11.5-19.9)	22.5 (18.1-25.0)	1342
Females (2005 - 2006)	3.83 (3.39-4.33)	3.21 (2.72-3.76)	8.08 (6.43-9.74)	20.8 (17.0-24.7)	29.0 (24.9-34.2)	1225
Females (2007 - 2008)	4.15 (3.57-4.83)	3.59 (3.19-4.18)	7.40 (5.88-9.63)	16.8 (12.9-20.2)	22.7 (20.0-25.5)	1275
Females (2009 - 2010)	4.10 (3.80-4.41)	3.89 (3.52-4.16)	7.17 (6.54-8.06)	14.6 (13.0-16.8)	21.7 (19.2-23.9)	1348

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxynaphthalene (2-Naphthol) (creatinine corrected) (2001 – 2010)

CAS Number 135-19-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	2.52 (2.23-2.85)	2.35 (2.01-2.95)	4.65 (3.97-5.21)	7.32 (6.05-8.09)	12.1 (7.82-15.3)	665
Mexican Americans (2003 - 2004)	2.83 (2.44-3.28)	2.57 (2.20-3.23)	5.00 (4.10-5.95)	10.3 (6.79-13.0)	13.3 (11.0-15.5)	648
Mexican Americans (2005 - 2006)	4.05 (3.77-4.35)	4.03 (3.65-4.36)	7.05 (6.30-8.05)	12.6 (9.53-15.1)	17.4 (13.4-20.6)	621
Mexican Americans (2007 - 2008)	4.58 (3.97-5.28)	4.38 (3.55-5.02)	7.59 (6.30-9.38)	14.2 (11.6-16.4)	19.1 (16.0-24.7)	515
Mexican Americans (2009 - 2010)	4.44 (4.02-4.90)	4.30 (3.79-5.03)	7.80 (7.28-8.47)	12.9 (11.1-14.6)	18.8 (13.8-22.8)	566
Non-Hispanic blacks (2001 - 2002)	2.79 (2.39-3.27)	2.41 (2.04-2.77)	5.98 (4.84-6.98)	11.6 (9.09-15.3)	17.4 (12.2-23.4)	692
Non-Hispanic blacks (2003 - 2004)	3.31 (2.70-4.04)	3.06 (2.31-3.86)	6.92 (5.12-9.33)	12.8 (10.4-16.5)	18.6 (15.7-22.1)	673
Non-Hispanic blacks (2005 - 2006)	3.51 (3.16-3.89)	3.10 (2.59-3.53)	6.71 (5.33-8.04)	12.3 (10.3-16.1)	19.7 (16.1-25.0)	657
Non-Hispanic blacks (2007 - 2008)	3.80 (3.47-4.15)	3.45 (3.08-3.90)	6.73 (5.57-8.41)	13.1 (11.3-14.9)	19.2 (14.8-26.5)	587
Non-Hispanic blacks (2009 - 2010)	3.80 (3.47-4.15)	3.37 (3.10-3.85)	7.27 (6.54-8.32)	13.4 (10.8-16.8)	18.7 (13.4-23.5)	517
Non-Hispanic whites (2001 - 2002)	2.16 (1.78-2.62)	1.74 (1.44-2.18)	4.34 (3.32-6.09)	11.9 (9.93-14.3)	16.9 (13.8-20.6)	1207
Non-Hispanic whites (2003 - 2004)	3.03 (2.65-3.46)	2.46 (2.10-2.98)	7.14 (5.09-8.91)	15.6 (13.3-17.6)	21.9 (17.1-24.1)	1062
Non-Hispanic whites (2005 - 2006)	3.40 (3.08-3.77)	2.73 (2.39-3.26)	7.45 (6.10-9.65)	17.9 (15.3-20.7)	24.9 (21.3-29.0)	980
Non-Hispanic whites (2007 - 2008)	3.75 (3.18-4.43)	3.28 (2.60-4.08)	6.91 (5.53-9.51)	16.8 (12.8-19.8)	22.2 (19.4-25.5)	1044
Non-Hispanic whites (2009 - 2010)	3.57 (3.27-3.90)	3.18 (2.82-3.71)	6.27 (5.67-7.13)	14.8 (13.1-15.8)	20.8 (19.0-22.5)	1203

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 2-Hydroxynaphthalene (2-Naphthol) (creatinine corrected) (2011 – 2014)

CAS Number 135-19-3

Metabolite of Naphthalene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	4.72 (4.39-5.08)	4.32 (4.00-4.78)	9.30 (8.40-10.1)	17.6 (15.5-18.7)	23.4 (20.2-25.9)	2490
Total population (2013 - 2014)	4.90 (4.67-5.13)	4.77 (4.40-5.09)	9.43 (9.01-9.81)	16.1 (15.1-17.5)	22.0 (19.9-24.3)	2640
Age 6-11 years (2011 - 2012)	4.50 (3.93-5.16)	4.18 (3.68-4.96)	7.81 (6.44-9.37)	14.6 (11.2-17.1)	19.2 (15.3-22.6)	396
Age 6-11 years (2013 - 2014)	4.55 (3.93-5.27)	4.19 (3.34-5.20)	7.50 (6.01-9.56)	11.9 (9.89-15.9)	18.7 (12.8-25.2)	399
Age 12-19 years (2011 - 2012)	4.19 (3.61-4.86)	3.82 (3.26-4.63)	6.97 (5.26-8.92)	12.9 (9.70-14.9)	20.5 (12.9-32.1)	389
Age 12-19 years (2013 - 2014)	4.62 (4.14-5.15)	4.45 (3.73-5.55)	8.20 (6.52-9.59)	13.0 (11.0-16.8)	17.3 (13.6-22.8)	449
Age 20+ years (2011 - 2012)	4.84 (4.48-5.22)	4.50 (4.07-4.98)	9.88 (9.07-11.0)	18.1 (16.4-19.4)	24.0 (20.8-26.7)	1705
Age 20+ years (2013 - 2014)	4.98 (4.69-5.28)	4.91 (4.32-5.32)	9.86 (9.28-10.5)	17.1 (15.8-18.4)	22.6 (20.6-25.3)	1792
Males (2011 - 2012)	4.01 (3.61-4.44)	3.71 (3.23-4.19)	7.61 (6.50-8.89)	14.2 (12.1-15.8)	19.6 (17.4-22.3)	1257
Males (2013 - 2014)	4.16 (3.83-4.51)	3.88 (3.56-4.32)	7.90 (6.98-8.43)	13.8 (11.6-16.5)	19.1 (15.1-24.3)	1309
Females (2011 - 2012)	5.53 (5.01-6.11)	5.22 (4.62-5.94)	11.4 (9.85-12.8)	19.1 (17.4-22.6)	25.9 (21.6-31.0)	1233
Females (2013 - 2014)	5.74 (5.39-6.11)	5.77 (5.29-6.28)	10.8 (9.79-12.3)	18.4 (16.6-19.9)	23.2 (21.5-26.1)	1331
Mexican Americans (2011 - 2012)	6.59 (5.61-7.75)	6.22 (5.54-7.60)	11.6 (9.38-14.3)	20.1 (14.3-26.3)	26.3 (18.5-44.9)	317
Mexican Americans (2013 - 2014)	6.17 (5.65-6.73)	5.97 (5.49-6.58)	10.1 (9.08-11.3)	17.0 (13.4-22.8)	23.9 (17.0-35.2)	449
Non-Hispanic blacks (2011 - 2012)	5.17 (4.58-5.85)	5.26 (4.59-6.16)	9.33 (8.09-10.7)	15.3 (13.5-17.3)	19.6 (17.9-22.0)	664
Non-Hispanic blacks (2013 - 2014)	5.75 (5.29-6.24)	5.55 (4.99-6.43)	9.68 (8.83-10.8)	14.9 (13.9-16.1)	19.1 (15.8-24.2)	576
Non-Hispanic whites (2011 - 2012)	4.32 (3.96-4.70)	3.81 (3.40-4.21)	8.89 (7.40-10.0)	17.6 (14.5-18.7)	21.9 (18.7-27.7)	812
Non-Hispanic whites (2013 - 2014)	4.56 (4.27-4.87)	4.16 (3.83-4.70)	9.14 (8.21-9.86)	16.8 (14.5-18.4)	21.7 (19.1-25.3)	974
All Hispanics (2011 - 2012)	6.37 (5.80-7.00)	6.04 (5.65-6.77)	11.6 (9.85-13.3)	19.2 (15.8-23.8)	25.9 (21.9-30.4)	573
All Hispanics (2013 - 2014)	6.08 (5.58-6.63)	6.02 (5.53-6.35)	10.5 (9.28-11.6)	17.6 (13.8-22.8)	23.9 (18.8-28.3)	695
Asians (2011 - 2012)	3.89 (3.22-4.71)	3.91 (3.08-4.86)	6.94 (5.70-8.22)	12.9 (8.67-19.0)	19.1 (13.7-23.1)	352
Asians (2013 - 2014)	4.07 (3.33-4.98)	3.90 (2.92-5.16)	7.94 (6.18-9.44)	13.4 (9.87-19.3)	20.5 (12.8-27.4)	291

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Naphthalene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/PAHs_FactSheet.html

Urinary 3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1) (2013 – 2014)

CAS Number 62450-06-0

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2569
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	374
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1756
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1282
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	945
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	681
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.79.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1) (creatinine corrected) (2013 – 2014)

CAS Number 62450-06-0

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2568
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	374
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1755
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1286
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1282
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	944
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	681
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA- α -C) (2013 – 2014)

CAS Number 68006-83-7

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	1.19 (.670-1.76)	3.11 (2.27-3.95)	2569
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	1.51 (<LOD-3.95)	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	1.56 (1.03-2.06)	3.51 (2.67-4.41)	1755
Males (2013 - 2014)	*	< LOD	< LOD	1.39 (.880-2.00)	3.78 (2.66-4.50)	1286
Females (2013 - 2014)	*	< LOD	< LOD	.970 (.370-1.74)	2.43 (1.74-3.61)	1283
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	.520 (<LOD-1.47)	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	2.84 (1.83-4.02)	4.62 (3.63-6.39)	554
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	1.37 (.580-2.04)	3.41 (2.02-4.44)	944
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.330 (<LOD-.870)	.980 (.490-2.04)	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.820 (<LOD-2.09)	285

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.33.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA- α -C) (creatinine corrected) (2013 – 2014)

CAS Number 68006-83-7

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	1.64 (1.28-2.24)	3.36 (2.44-4.97)	2568
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	1.28 (<LOD-3.27)	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	2.04 (1.44-2.56)	4.27 (2.87-5.26)	1754
Males (2013 - 2014)	*	< LOD	< LOD	1.61 (1.15-2.30)	3.92 (2.30-5.26)	1285
Females (2013 - 2014)	*	< LOD	< LOD	1.77 (1.35-2.09)	3.20 (2.42-4.59)	1283
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	1.28 (<LOD-2.83)	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	2.43 (1.49-3.03)	4.84 (2.86-6.20)	554
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	1.98 (1.35-2.56)	4.27 (2.55-5.88)	943
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.885 (<LOD-1.21)	1.66 (1.05-2.87)	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	1.78 (<LOD-2.09)	285

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP) (2013 – 2014)

CAS Number 105650-23-5

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	.460 (.390-.530)	1.88 (1.53-2.30)	7.10 (5.89-8.63)	15.8 (13.9-18.9)	2569
Age 6-11 years (2013 - 2014)	*	< LOD	.810 (.530-1.33)	2.45 (1.39-3.99)	5.00 (2.45-6.12)	375
Age 12-19 years (2013 - 2014)	.775 (.673-.892)	.610 (.390-.800)	1.53 (1.10-2.16)	4.90 (3.75-7.77)	11.5 (7.69-20.8)	438
Age 20+ years (2013 - 2014)	*	.470 (.400-.550)	2.12 (1.64-2.74)	7.97 (6.58-10.5)	17.3 (14.3-20.8)	1756
Males (2013 - 2014)	*	.530 (.460-.620)	2.08 (1.61-2.69)	7.89 (5.68-11.3)	17.3 (11.3-25.2)	1285
Females (2013 - 2014)	*	.380 (<LOD-.490)	1.70 (1.30-2.10)	6.78 (4.89-8.55)	14.3 (9.67-20.8)	1284
Mexican Americans (2013 - 2014)	.976 (.807-1.18)	.670 (.510-.860)	2.69 (1.70-3.83)	8.71 (6.21-10.4)	14.2 (8.76-35.0)	440
Non-Hispanic blacks (2013 - 2014)	.993 (.890-1.11)	.750 (.630-.930)	2.31 (1.90-2.91)	6.60 (5.10-8.49)	17.4 (9.87-20.8)	554
Non-Hispanic whites (2013 - 2014)	*	.390 (<LOD-.450)	1.61 (1.14-2.30)	6.90 (4.94-9.77)	16.8 (12.9-20.7)	945
All Hispanics (2013 - 2014)	.967 (.815-1.15)	.650 (.520-.850)	2.61 (1.78-3.55)	8.66 (7.10-10.3)	14.6 (10.6-19.2)	683
Asians (2013 - 2014)	*	< LOD	.980 (.560-1.44)	4.72 (2.58-7.91)	13.4 (6.07-15.5)	284

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.34.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP) (creatinine corrected)

CAS Number 105650-23-5

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	.706 (.653-.750)	2.02 (1.76-2.39)	8.07 (6.58-9.66)	15.4 (12.2-18.5)	2568
Age 6-11 years (2013 - 2014)	*	< LOD	1.33 (.942-1.76)	3.84 (2.00-7.13)	7.55 (4.20-13.7)	375
Age 12-19 years (2013 - 2014)	.709 (.592-.850)	.574 (.437-.755)	1.22 (.984-2.00)	4.71 (2.84-6.52)	10.6 (5.12-13.6)	438
Age 20+ years (2013 - 2014)	*	.727 (.676-.777)	2.21 (1.91-2.69)	9.20 (7.78-10.6)	16.0 (13.1-19.9)	1755
Males (2013 - 2014)	*	.667 (.595-.709)	2.00 (1.71-2.59)	7.55 (5.51-10.8)	13.5 (10.1-18.5)	1284
Females (2013 - 2014)	*	.739 (<LOD-.841)	2.04 (1.73-2.40)	8.49 (6.52-10.6)	16.0 (12.4-25.1)	1284
Mexican Americans (2013 - 2014)	1.13 (.980-1.29)	.881 (.750-1.01)	2.93 (2.04-3.97)	11.1 (5.15-12.9)	13.9 (11.5-23.4)	440
Non-Hispanic blacks (2013 - 2014)	.776 (.690-.873)	.677 (.571-.796)	1.76 (1.44-2.05)	4.74 (3.32-6.28)	8.59 (6.29-11.7)	554
Non-Hispanic whites (2013 - 2014)	*	.686 (<LOD-.774)	1.91 (1.67-2.64)	8.36 (6.56-10.1)	15.9 (12.9-22.1)	944
All Hispanics (2013 - 2014)	1.09 (.962-1.23)	.800 (.698-.919)	2.84 (2.04-3.55)	10.2 (6.25-12.4)	16.0 (12.4-20.1)	683
Asians (2013 - 2014)	*	< LOD	1.59 (1.09-2.59)	6.07 (3.64-10.1)	13.7 (7.51-24.7)	284

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-9H-pyrido[2,3-b]indole (A-α-C) (2013 – 2014)

CAS Number 26148-68-5

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	.630 (<LOD-.720)	2.30 (1.65-3.39)	23.9 (16.9-32.9)	58.2 (46.0-73.9)	2568
Age 6-11 years (2013 - 2014)	*	< LOD	.850 (.720-.930)	1.43 (1.13-1.83)	2.07 (1.54-3.12)	375
Age 12-19 years (2013 - 2014)	*	< LOD	1.21 (.960-1.39)	4.18 (2.27-19.9)	27.9 (3.43-58.2)	438
Age 20+ years (2013 - 2014)	*	.680 (<LOD-.790)	3.72 (2.24-5.30)	29.1 (20.3-42.1)	65.2 (51.8-79.7)	1755
Males (2013 - 2014)	*	.740 (<LOD-.840)	2.91 (1.97-4.44)	26.3 (17.8-36.8)	61.4 (48.0-77.9)	1285
Females (2013 - 2014)	*	< LOD	1.73 (1.28-2.95)	20.1 (12.0-34.8)	54.5 (32.3-73.6)	1283
Mexican Americans (2013 - 2014)	*	.620 (<LOD-.720)	1.43 (1.13-1.73)	5.01 (3.02-7.90)	18.5 (5.45-31.0)	440
Non-Hispanic blacks (2013 - 2014)	*	.760 (.620-.970)	6.63 (3.38-10.8)	49.1 (30.7-73.1)	79.8 (62.8-97.2)	554
Non-Hispanic whites (2013 - 2014)	*	.620 (<LOD-.760)	2.69 (1.59-4.44)	27.4 (15.0-47.5)	60.5 (47.6-83.1)	943
All Hispanics (2013 - 2014)	*	.630 (<LOD-.720)	1.63 (1.16-2.36)	7.63 (3.55-20.9)	23.9 (10.9-40.4)	683
Asians (2013 - 2014)	*	< LOD	.980 (.760-1.34)	2.96 (1.36-16.1)	16.1 (2.96-36.8)	285

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.62.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-9H-pyrido[2,3-b]indole (A-α-C) (creatinine corrected) (2013 – 2014)

CAS Number 26148-68-5

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	1.00 (<LOD-1.16)	2.88 (2.32-4.00)	26.6 (17.0-35.8)	63.3 (43.0-81.3)	2567
Age 6-11 years (2013 - 2014)	*	< LOD	1.53 (1.33-1.76)	2.44 (2.10-2.93)	3.21 (2.59-4.00)	375
Age 12-19 years (2013 - 2014)	*	< LOD	1.33 (1.07-1.55)	5.35 (1.89-14.5)	20.9 (5.10-66.8)	438
Age 20+ years (2013 - 2014)	*	1.12 (<LOD-1.29)	4.00 (2.88-5.51)	32.7 (23.0-43.3)	69.3 (49.7-92.3)	1754
Males (2013 - 2014)	*	.912 (<LOD-1.02)	3.06 (2.31-4.05)	26.6 (17.0-34.2)	57.1 (37.2-81.7)	1284
Females (2013 - 2014)	*	< LOD	2.71 (2.13-4.00)	28.3 (14.4-43.1)	67.1 (39.1-91.2)	1283
Mexican Americans (2013 - 2014)	*	.957 (<LOD-1.07)	1.73 (1.48-1.97)	5.47 (3.67-6.86)	14.9 (5.57-49.8)	440
Non-Hispanic blacks (2013 - 2014)	*	.772 (.638-.929)	4.00 (2.18-7.83)	35.8 (24.6-49.7)	65.7 (45.7-82.8)	554
Non-Hispanic whites (2013 - 2014)	*	1.10 (<LOD-1.29)	3.51 (2.46-4.89)	30.2 (17.0-49.7)	74.8 (43.9-102)	942
All Hispanics (2013 - 2014)	*	.945 (<LOD-1.10)	1.84 (1.57-2.67)	6.50 (3.74-17.8)	28.1 (9.99-61.6)	683
Asians (2013 - 2014)	*	< LOD	1.85 (1.57-2.44)	6.29 (2.48-19.0)	19.0 (5.27-43.6)	285

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-3-methyl-3H-imidazo[4,5-f]quinolone (IQ) (2013 – 2014)

CAS Number 76180-96-6

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2572
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1758
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1285
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	946
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.37.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-3-methyl-3H-imidazo[4,5-f]quinolone (IQ) (creatinine corrected) (2013 – 2014)

CAS Number 76180-96-6

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2571
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1757
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1286
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1285
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	945
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole (Glu-P-1) (2013 – 2014)

CAS Number 67730-11-4

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2572
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1758
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1285
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	946
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.31.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole (Glu-P-1) (creatinine corrected)

CAS Number 67730-11-4

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2571
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1757
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1286
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1285
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	945
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Aminodipyrido[1,2-a:3',2'-d] imidazole (Glu-P-2) (2013 – 2014)

CAS Number 67730-11-4

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2572
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1758
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1285
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	946
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.83.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Aminodipyrido[1,2-a:3',2'-d] imidazole (Glu-P-2) (creatinine corrected) (2013 – 2014)

CAS Number 67730-11-4

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2571
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1757
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1286
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1285
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	945
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 1-Methyl-9H-pyrido[3,4-b]indole (Harman) (2013 – 2014)

CAS Number 486-84-0

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	139 (129-151)	125 (115-141)	253 (230-279)	553 (508-603)	863 (762-957)	2571
Age 6-11 years (2013 - 2014)	131 (115-150)	124 (104-142)	229 (178-266)	437 (371-511)	660 (511-768)	375
Age 12-19 years (2013 - 2014)	140 (114-173)	144 (99.2-180)	231 (206-288)	471 (352-711)	850 (497-1540)	439
Age 20+ years (2013 - 2014)	140 (130-150)	124 (115-138)	263 (235-291)	562 (535-637)	893 (759-1080)	1757
Males (2013 - 2014)	143 (129-159)	132 (116-149)	251 (215-304)	553 (405-648)	863 (727-1040)	1287
Females (2013 - 2014)	135 (123-149)	119 (107-138)	256 (223-295)	553 (500-663)	870 (749-1100)	1284
Mexican Americans (2013 - 2014)	85.6 (74.7-98.1)	80.1 (66.2-91.4)	135 (114-168)	259 (185-484)	555 (310-939)	440
Non-Hispanic blacks (2013 - 2014)	165 (143-191)	168 (143-196)	307 (244-374)	577 (443-691)	762 (618-900)	555
Non-Hispanic whites (2013 - 2014)	150 (132-170)	138 (115-159)	270 (236-316)	598 (538-727)	956 (768-1370)	945
All Hispanics (2013 - 2014)	91.4 (82.6-101)	84.0 (77.1-94.5)	155 (135-174)	296 (236-367)	522 (354-861)	683
Asians (2013 - 2014)	145 (126-165)	122 (107-138)	283 (230-395)	666 (488-1040)	1110 (608-1570)	285

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 4.59.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Urinary 1-Methyl-9H-pyrido[3,4-b]indole (Harman) (creatinine corrected) (2013 – 2014)

CAS Number 486-84-0

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	164 (155-174)	146 (132-160)	289 (276-306)	614 (574-671)	1030 (870-1110)	2570
Age 6-11 years (2013 - 2014)	204 (187-223)	191 (173-211)	310 (255-387)	715 (451-814)	826 (720-1030)	375
Age 12-19 years (2013 - 2014)	128 (115-143)	118 (100-129)	172 (153-215)	375 (275-504)	685 (436-1280)	439
Age 20+ years (2013 - 2014)	166 (157-177)	150 (132-167)	304 (285-327)	646 (580-713)	1090 (880-1220)	1756
Males (2013 - 2014)	145 (134-157)	129 (112-149)	253 (233-276)	543 (459-614)	850 (714-1020)	1286
Females (2013 - 2014)	186 (170-202)	163 (143-191)	330 (293-375)	713 (595-826)	1140 (866-1280)	1284
Mexican Americans (2013 - 2014)	98.6 (87.3-111)	85.8 (79.3-94.6)	154 (130-181)	322 (230-405)	535 (328-833)	440
Non-Hispanic blacks (2013 - 2014)	129 (116-143)	123 (103-138)	238 (191-286)	416 (348-473)	557 (439-659)	555
Non-Hispanic whites (2013 - 2014)	188 (174-204)	164 (151-185)	330 (294-373)	720 (627-836)	1160 (880-1320)	944
All Hispanics (2013 - 2014)	103 (95.8-110)	90.6 (86.3-99.1)	159 (146-176)	322 (269-362)	540 (369-740)	683
Asians (2013 - 2014)	230 (206-257)	218 (179-236)	444 (323-503)	861 (678-1270)	1600 (1010-2030)	285

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Urinary 1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2) (2013 – 2014)

CAS Number 62450-07-1

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2571
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1757
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1287
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1284
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	945
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 0.63.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2) (creatinine corrected) (2013 – 2014)

CAS Number 62450-07-1

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2570
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	375
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	439
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1756
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1286
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1284
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	440
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	944
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	285

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 9H-Pyrido[3,4-b]indole (Norharman) (2013 – 2014)

CAS Number 244-63-3

Geometric mean and selected percentiles of concentrations (in ng/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	333 (317-351)	332 (315-354)	628 (586-673)	1080 (1000-1190)	1470 (1290-1700)	2552
Age 6-11 years (2013 - 2014)	332 (294-374)	334 (289-398)	646 (490-730)	959 (854-1120)	1190 (980-1360)	374
Age 12-19 years (2013 - 2014)	324 (279-377)	335 (264-442)	603 (509-693)	905 (770-987)	1080 (907-1460)	439
Age 20+ years (2013 - 2014)	335 (318-353)	329 (311-351)	630 (581-701)	1120 (1030-1280)	1500 (1350-1720)	1739
Males (2013 - 2014)	367 (342-394)	367 (335-403)	662 (599-753)	1140 (1010-1310)	1630 (1290-1820)	1277
Females (2013 - 2014)	303 (282-325)	295 (271-333)	601 (544-655)	1030 (874-1140)	1400 (1130-1530)	1275
Mexican Americans (2013 - 2014)	283 (255-313)	287 (246-326)	510 (424-639)	1050 (816-1240)	1330 (1130-1520)	437
Non-Hispanic blacks (2013 - 2014)	370 (322-426)	379 (318-457)	666 (568-777)	1010 (890-1080)	1240 (1040-1580)	554
Non-Hispanic whites (2013 - 2014)	349 (322-377)	345 (315-377)	650 (589-739)	1120 (1000-1270)	1490 (1280-1720)	931
All Hispanics (2013 - 2014)	279 (260-299)	287 (265-308)	529 (471-592)	993 (867-1110)	1320 (1140-1470)	679
Asians (2013 - 2014)	253 (224-285)	243 (200-288)	466 (409-566)	983 (732-1280)	1470 (1010-1780)	285

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 is 12.6.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Urinary 9H-Pyrido[3,4-b]indole (Norharman) (creatinine corrected) (2013 – 2014)

CAS Number 244-63-3

Geometric mean and selected percentiles of urine concentrations (in ng/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	394 (377-412)	382 (359-400)	676 (632-727)	1130 (1020-1220)	1500 (1350-1690)	2551
Age 6-11 years (2013 - 2014)	516 (486-549)	488 (442-529)	820 (713-976)	1350 (1200-1430)	1500 (1350-1950)	374
Age 12-19 years (2013 - 2014)	297 (276-319)	286 (265-315)	462 (389-533)	695 (583-809)	879 (720-1300)	439
Age 20+ years (2013 - 2014)	400 (376-424)	388 (358-413)	714 (648-768)	1150 (1030-1250)	1580 (1330-1910)	1738
Males (2013 - 2014)	372 (354-391)	361 (333-397)	628 (572-678)	1040 (918-1230)	1370 (1170-1690)	1276
Females (2013 - 2014)	417 (393-442)	398 (375-426)	727 (648-800)	1170 (1080-1280)	1590 (1350-1980)	1275
Mexican Americans (2013 - 2014)	326 (291-365)	312 (272-336)	561 (427-675)	1060 (806-1360)	1570 (976-2350)	437
Non-Hispanic blacks (2013 - 2014)	289 (263-318)	294 (237-355)	471 (420-513)	743 (617-852)	937 (860-1040)	554
Non-Hispanic whites (2013 - 2014)	441 (421-462)	423 (400-453)	756 (713-816)	1180 (1070-1280)	1550 (1350-1910)	930
All Hispanics (2013 - 2014)	314 (290-340)	301 (267-326)	534 (447-629)	993 (861-1200)	1410 (1150-1800)	679
Asians (2013 - 2014)	402 (359-449)	388 (332-429)	707 (600-787)	1190 (991-1460)	1680 (1230-2710)	285

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Blood 1,1,1-Trichloroethane (Methyl chloroform) (2003 – 2010)

CAS Number 71-55-6

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1345
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3085
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2907
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3333
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	911
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	469
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	570
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1345
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1524
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1565
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1831
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	.014 (<LOD-.021)	650
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	873
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	932
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	660
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1464
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1442
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1644
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	685
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1621
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1465
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1689
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	762
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	575
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	675
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	289
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	791
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	581
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	591
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	688
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1303
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1291
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1499

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.048, 0.01, 0.01, and 0.01 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,1,1-Trichloroethane (Methyl chloroform) (2011 – 2016)

CAS Number 71-55-6

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2662
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3204
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3079
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	500
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	599
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	544
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2162
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2605
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2535
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1323
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1546
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1521
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1339
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1658
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1558
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	292
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	505
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	553
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	718
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	639
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	880
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1305
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1000
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	575
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	810
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	966
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	409
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	364
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	347

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.010, 0.010, and 0.010 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,1,1,2-Tetrachloroethane (2007 – 2010)

CAS Number 79-34-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2750
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3280
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	452
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	551
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1493
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1801
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	805
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	928
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1365
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1617
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1385
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1663
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	556
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	644
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	546
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	583
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1197
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1505

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 and 09-10 are 0.04 and 0.04, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,1,1,2-Tetrachloroethane (2011 – 2016)

CAS Number 79-34-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2789
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3148
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3082
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	525
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	591
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	545
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2264
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2557
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2537
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1396
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1512
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1524
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1393
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1636
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1558
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	300
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	501
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	556
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	740
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	602
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	638
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	954
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1274
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1000
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	598
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	802
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	968
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	413
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	360
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.040, 0.040, and 0.040 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,1,2,2-Tetrachloroethane (2003 – 2010)

CAS Number 79-34-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1235
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3131
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2922
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3371
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	924
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	464
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	579
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1235
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1542
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1575
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1849
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	665
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	883
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	943
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	613
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1484
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1447
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1664
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	622
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1647
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1475
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1707
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	250
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	753
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	554
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	681
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	282
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	823
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	594
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	597
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	606
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1323
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1310
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1527

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.01, 0.01, 0.01, and 0.01 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,1,2,2-Tetrachloroethane (2011 – 2012)‡

CAS Number 79-34-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2681
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	505
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2176
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1346
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1335
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	282
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	720
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	913
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	569
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	396

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.01.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result. .

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,1,2-Trichloroethane (2003 – 2010)

CAS Number 79-00-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1354
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3165
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2701
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3240
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	936
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	436
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	556
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1354
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1556
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1458
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1779
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	673
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	807
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	905
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	664
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1499
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1338
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1600
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	690
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1666
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1363
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1640
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	777
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	534
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	674
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	297
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	824
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	572
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	577
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	686
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1331
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1183
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1439

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.01, 0.01, 0.01, and 0.01 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,1,2-Trichloroethane (2011 – 2012)‡

CAS Number 79-00-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2783
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	520
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2263
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1392
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1391
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	298
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	738
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	971
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	588
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	402

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.01.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,2,3-Trichloropropane (2007 – 2010)

CAS Number 96-18-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2592
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3260
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	413
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	560
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1398
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1788
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	781
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	912
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1284
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1606
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1308
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1654
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	518
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	660
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	541
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	573
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1133
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1484

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 and 09-10 are 0.04 and 0.04, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,2,3-Trichloropropane (2011 – 2016)

CAS Number 96-18-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2761
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3177
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3036
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	520
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	592
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	540
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2241
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2585
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2496
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1384
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1535
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1497
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1377
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1642
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1539
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	300
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	494
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	535
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	737
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	635
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	938
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1297
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	994
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	589
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	794
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	935
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	413
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	362
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	346

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.040, 0.040, and 0.040 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,1-Dichloroethane (2003 – 2010)

CAS Number 75-34-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1367
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3193
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2800
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3330
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	941
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	446
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	567
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1367
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1569
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1505
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1833
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	683
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	849
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	930
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	670
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1510
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1380
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1647
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	697
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1683
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1420
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1683
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	778
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	548
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	680
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	300
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	832
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	577
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	590
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1347
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1239
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1489

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.01, 0.01, 0.01, and 0.01 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,1-Dichloroethane (2011 – 2012)‡

CAS Number 75-34-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2736
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	507
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2229
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1367
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1369
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	299
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	734
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	928
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	597
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	398

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.01.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result. .

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,1-Dichloroethene (Vinylidene chloride) (2003 – 2010)

CAS Number 75-34-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1367
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3163
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2810
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3133
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	931
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	447
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	540
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1367
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1555
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1503
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1706
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	677
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	860
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	887
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	670
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1502
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1398
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1549
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	697
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1661
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1412
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1584
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	774
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	525
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	651
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	300
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	823
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	584
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	569
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1332
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1255
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1374

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.009, 0.009, 0.009, and 0.009 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,1-Dichloroethene (Vinylidene chloride) (2011 – 2012)‡

CAS Number 75-34-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2804
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	528
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2276
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1406
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1398
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	299
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	739
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	969
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	596
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	416

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.009.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,2-Dibromo-3-chloropropane (DBCP) (2003 – 2010)‡

CAS Number 96-12-8

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1170
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2998
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2837
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3391
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	875
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	469
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	580
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1170
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1485
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1522
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1861
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	638
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	846
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	950
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	568
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1409
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1397
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1673
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	602
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1589
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1440
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1718
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	234
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	752
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	565
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	681
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	239
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	737
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	602
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	603
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1287
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1231
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1536

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.1, 0.1, and 0.1 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result. .

‡Not measured after Survey years 2009-2010.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/DBCP_BiomonitoringSummary.html

Blood 1,2-Dibromoethane (2007 – 2010)

CAS Number 106-93-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2577
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3212
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	409
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	551
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1389
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1768
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	779
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	893
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1270
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1582
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1307
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1630
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	471
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	620
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	532
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	579
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1165
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1465

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 and 09-10 are 0.015 and 0.015, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,2-Dibromoethane (2011 – 2016)

CAS Number 106-93-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2788
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3203
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2986
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	523
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	599
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	534
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2265
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2604
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2452
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1400
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1546
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1474
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1388
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1657
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1512
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	300
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	505
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	538
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	742
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	618
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	958
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1305
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	968
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	589
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	809
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	943
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	415
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	364
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	338

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.015, 0.015, and 0.015 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,2-Dichlorobenzene (o-Dichlorobenzene) (2003 – 2010)

CAS Number 95-50-1

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1327
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3083
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2803
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3074
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	921
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	455
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	513
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1327
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1523
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1510
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1706
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	639
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	838
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	855
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	647
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1457
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1388
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1514
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	680
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1626
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1415
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1560
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	250
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	766
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	544
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	623
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	291
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	801
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	579
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	540
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	682
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1288
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1237
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1391

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.1, 0.1, 0.025, and 0.025 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,2-Dichlorobenzene (o-Dichlorobenzene) (2011 – 2016)

CAS Number 95-50-1

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2697
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3146
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3005
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	502
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	587
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	532
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2195
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2559
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2473
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1340
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1519
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1484
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1357
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1627
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1521
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	289
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	486
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	554
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	687
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	613
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	628
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	942
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1283
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	965
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	582
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	784
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	953
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	404
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	359
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	337

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.025, 0.025, and 0.025 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,2-Dichloroethane (Ethylene dichloride) (2003 – 2010)

CAS Number 107-06-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1346
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3082
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2767
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3358
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	906
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	443
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	574
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1346
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1520
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1484
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1843
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	656
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	840
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	941
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	661
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1452
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1375
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1657
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	685
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1630
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1392
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1701
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	763
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	533
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	675
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	289
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	795
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	554
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	594
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	689
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1297
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1244
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1521

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.01, 0.01, 0.01, and 0.01 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,2-Dichloroethane (Ethylene dichloride) (2011 – 2016)

CAS Number 107-06-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2784
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3203
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3035
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	522
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	599
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	532
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2262
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2604
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2503
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1394
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1546
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1498
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1390
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1657
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1537
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	300
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	504
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	555
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	737
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	627
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	953
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1305
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	983
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	598
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	809
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	964
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	412
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	364
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	337

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.010, 0.010, and 0.010 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood cis-1,2-Dichloroethene (2003 – 2010)

CAS Number 156-59-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1366
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3140
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2897
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3313
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	924
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	463
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	573
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1366
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1539
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1556
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1817
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	677
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	878
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	923
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	669
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1481
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1432
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1636
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	697
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1659
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1465
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1677
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	757
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	576
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	680
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	300
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	591
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	592
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	694
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1329
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1283
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1477

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.01, 0.01, 0.01, and 0.01 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood cis-1,2-Dichloroethene (2011 – 2012)‡

CAS Number 156-59-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2754
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	515
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2239
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1374
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1380
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	297
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	721
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	945
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	592
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	413

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.01.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood trans-1,2-Dichloroethene (2003 – 2010)

CAS Number 156-60-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1367
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3193
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2843
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3241
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	941
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	468
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	559
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1367
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1569
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1524
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1782
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	683
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	851
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	900
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	670
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1511
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1415
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1605
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	697
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1682
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1428
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1636
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	779
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	574
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	678
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	300
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	832
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	580
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	584
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	695
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1346
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1249
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1431

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.01, 0.01, 0.01, and 0.01 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood trans-1,2-Dichloroethene (2011 – 2012)†

CAS Number 156-60-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2754
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	516
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2238
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1385
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1369
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	295
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	729
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	951
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	581
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	410

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.01.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

†Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,2-Dichloropropane (2003 – 2010)

CAS Number 78-87-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1364
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3120
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2840
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3255
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	918
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	469
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	558
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1364
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1536
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1524
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1795
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	666
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	847
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	902
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	667
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1478
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1413
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1604
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	697
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1642
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1427
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1651
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	755
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	562
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	643
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	300
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	811
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	582
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	591
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	692
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1322
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1245
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1478

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.008, 0.008, 0.01, and 0.01 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,2-Dichloropropane (2011 – 2012)‡

CAS Number 78-87-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2740
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	517
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2223
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1371
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1369
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	295
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	718
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	937
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	589
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	413

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.01.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result. .

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood 1,3-Dichlorobenzene (m-Dichlorobenzene) (2003 – 2010)

CAS Number 95-50-1

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1334
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3148
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2484
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3294
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	928
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	405
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	570
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1334
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1545
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1345
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1808
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	675
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	734
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	916
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	659
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1491
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1217
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1623
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	675
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1657
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1267
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1671
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	266
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	774
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	483
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	671
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	279
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	809
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	534
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	592
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	686
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1330
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1072
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1465

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.05, 0.05, 0.025, and 0.025 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,3-Dichlorobenzene (m-Dichlorobenzene) (2011 – 2016)

CAS Number 95-50-1

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2743
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3175
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3041
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	510
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	593
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	541
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2233
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2582
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2500
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1378
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1528
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1507
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1365
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1647
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1534
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	297
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	502
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	539
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	698
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	609
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	630
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	961
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1290
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	993
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	590
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	805
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	948
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	411
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	361
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	346

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.025, 0.025, and 0.025 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,4-Dichlorobenzene (Paradichlorobenzene) (2001 – 2010)

CAS Number 106-46-7

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	*	< LOD	.300 (.190-.550)	1.19 (.610-2.90)	4.10 (1.40-7.60)	807
Total population (2003 - 2004)	*	< LOD	.320 (.250-.400)	1.10 (.710-1.60)	3.30 (1.70-5.10)	1322
Total population (2005 - 2006)	*	.085 (.085-.085)	.218 (.180-.260)	.917 (.643-1.31)	3.59 (1.80-5.50)	3126
Total population (2007 - 2008)	*	.054 (.043-.071)	.186 (.138-.262)	.869 (.543-1.35)	2.69 (1.52-7.13)	2330
Total population (2009 - 2010)	*	.043 (<LOD-.054)	.161 (.117-.213)	.609 (.433-.959)	2.13 (1.06-4.03)	3205
Age 12-19 years (2005 - 2006)	*	.085 (.085-.085)	.220 (.160-.280)	.960 (.560-2.00)	4.27 (2.37-6.10)	926
Age 12-19 years (2007 - 2008)	.118 (.089-.155)	.074 (.049-.109)	.244 (.147-.520)	1.11 (.743-2.10)	4.16 (1.18-20.1)	379
Age 12-19 years (2009 - 2010)	*	.046 (<LOD-.066)	.196 (.125-.271)	.890 (.335-2.28)	2.33 (.884-7.79)	549
Age 20-59 years (2001 - 2002)	*	< LOD	.300 (.190-.550)	1.19 (.610-2.90)	4.10 (1.40-7.60)	807
Age 20-59 years (2003 - 2004)	*	< LOD	.320 (.250-.400)	1.10 (.710-1.60)	3.30 (1.70-5.10)	1322
Age 20-59 years (2005 - 2006)	*	.085 (.085-.085)	.220 (.170-.260)	.910 (.540-1.50)	3.77 (1.50-7.33)	1537
Age 20-59 years (2007 - 2008)	*	.052 (<LOD-.071)	.184 (.121-.266)	.788 (.464-1.49)	2.67 (1.36-7.58)	1250
Age 20-59 years (2009 - 2010)	*	.042 (<LOD-.058)	.153 (.103-.227)	.591 (.363-.999)	1.77 (.865-3.80)	1751
Age 60+ years (2005 - 2006)	*	.085 (.085-.085)	.207 (.158-.313)	.877 (.525-1.80)	3.06 (1.50-4.20)	663
Age 60+ years (2007 - 2008)	*	.055 (<LOD-.072)	.169 (.120-.280)	.768 (.461-1.16)	2.28 (.936-7.84)	698
Age 60+ years (2009 - 2010)	*	.041 (<LOD-.051)	.153 (.107-.204)	.663 (.452-1.06)	3.48 (1.46-5.74)	905
Males (2001 - 2002)	*	< LOD	.270 (.180-.530)	.900 (.570-2.90)	3.60 (1.10-7.20)	390
Males (2003 - 2004)	*	< LOD	.320 (.250-.380)	.770 (.580-1.20)	1.90 (1.20-4.00)	651
Males (2005 - 2006)	*	.085 (.085-.085)	.230 (.188-.290)	.950 (.603-1.50)	3.50 (1.50-7.20)	1479
Males (2007 - 2008)	.102 (.081-.126)	.065 (.052-.080)	.205 (.156-.274)	.833 (.497-1.33)	2.14 (1.05-8.40)	1133
Males (2009 - 2010)	*	.048 (<LOD-.065)	.176 (.132-.248)	.610 (.470-.971)	2.33 (1.13-3.65)	1574
Females (2001 - 2002)	*	< LOD	.360 (.190-.620)	1.20 (.620-3.90)	4.10 (1.68-8.30)	417
Females (2003 - 2004)	*	< LOD	.350 (.220-.450)	1.40 (.810-2.10)	4.10 (2.20-5.90)	671
Females (2005 - 2006)	*	.085 (.085-.085)	.180 (.140-.240)	.865 (.522-1.70)	3.59 (2.10-5.18)	1647
Females (2007 - 2008)	*	.048 (<LOD-.065)	.155 (.108-.268)	.894 (.537-1.61)	3.11 (1.68-8.10)	1197
Females (2009 - 2010)	*	< LOD	.142 (.102-.192)	.593 (.349-.992)	1.95 (.947-5.18)	1631

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.12, 0.12, 0.011, 0.04, and 0.04, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,4-Dichlorobenzene (Paradichlorobenzene) (2001 – 2010)

CAS Number 106-46-7

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	.331 (.246-.446)	.180 (<LOD-.260)	.790 (.400-1.30)	6.00 (1.30-16.0)	16.0 (6.20-33.0)	217
Mexican Americans (2003 - 2004)	.381 (.256-.566)	.210 (.140-.400)	.730 (.370-2.90)	6.20 (2.90-9.30)	10.0 (6.30-19.0)	262
Mexican Americans (2005 - 2006)	.412 (.309-.549)	.210 (.150-.290)	1.20 (.680-2.97)	8.80 (3.80-16.0)	16.0 (8.10-33.0)	772
Mexican Americans (2007 - 2008)	.251 (.119-.529)	.179 (.059-.420)	.864 (.304-4.30)	7.76 (2.14-17.8)	19.0 (10.5-23.4)	459
Mexican Americans (2009 - 2010)	*	.058 (<LOD-.156)	.267 (.110-1.58)	3.85 (.417-17.9)	13.6 (2.39-31.0)	647
Non-Hispanic blacks (2001 - 2002)	.558 (.376-.827)	.360 (.260-.560)	1.80 (.710-3.90)	6.30 (1.40-29.0)	15.0 (3.60-51.0)	136
Non-Hispanic blacks (2003 - 2004)	.423 (.292-.613)	.340 (.200-.480)	.980 (.550-1.50)	4.10 (1.60-9.20)	11.0 (2.50-19.0)	297
Non-Hispanic blacks (2005 - 2006)	.381 (.272-.532)	.230 (.160-.330)	.860 (.500-1.70)	5.24 (2.00-11.5)	12.7 (8.41-21.0)	805
Non-Hispanic blacks (2007 - 2008)	.235 (.181-.303)	.151 (.112-.200)	.688 (.410-1.04)	3.76 (2.14-9.10)	12.7 (6.00-21.3)	502
Non-Hispanic blacks (2009 - 2010)	.211 (.147-.304)	.148 (.095-.200)	.540 (.349-1.12)	4.60 (1.64-11.5)	14.8 (4.94-23.3)	564
Non-Hispanic whites (2001 - 2002)	*	< LOD	.200 (<LOD-.380)	.570 (.300-1.20)	1.19 (.570-3.70)	396
Non-Hispanic whites (2003 - 2004)	*	< LOD	.200 (.160-.260)	.490 (.370-.720)	.940 (.690-2.00)	658
Non-Hispanic whites (2005 - 2006)	*	.085 (.085-.085)	.134 (.085-.180)	.438 (.260-.670)	1.16 (.520-2.30)	1319
Non-Hispanic whites (2007 - 2008)	*	.043 (<LOD-.055)	.095 (.081-.137)	.377 (.291-.486)	.898 (.543-1.49)	1015
Non-Hispanic whites (2009 - 2010)	*	< LOD	.105 (.076-.162)	.363 (.253-.535)	.783 (.593-1.12)	1452

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.12, 0.12, 0.011, 0.04, and 0.04, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,4-Dichlorobenzene (Paradichlorobenzene) (2011 – 2016)

CAS Number 106-46-7

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	.143 (.097-.218)	.670 (.383-1.07)	2.13 (1.25-3.64)	2709
Total population (2013 - 2014)	*	< LOD	.074 (.054-.102)	.301 (.194-.488)	1.07 (.512-2.25)	3172
Total population (2015 - 2016)	*	< LOD	.098 (.064-.166)	.403 (.247-.821)	1.38 (.647-2.71)	3067
Age 12-19 years (2011 - 2012)	*	< LOD	.144 (.070-.321)	.543 (.261-1.07)	1.49 (.670-6.56)	501
Age 12-19 years (2013 - 2014)	*	< LOD	.084 (.054-.183)	.388 (.183-1.42)	1.44 (.363-5.89)	593
Age 12-19 years (2015 - 2016)	*	< LOD	.127 (.076-.229)	.593 (.270-1.63)	2.08 (.751-6.07)	545
Age 20+ years (2011 - 2012)	*	< LOD	.143 (.101-.217)	.745 (.376-1.07)	2.16 (1.36-3.62)	2208
Age 20+ years (2013 - 2014)	*	< LOD	.071 (.052-.098)	.292 (.188-.457)	.949 (.503-2.00)	2579
Age 20+ years (2015 - 2016)	*	< LOD	.096 (.061-.161)	.384 (.236-.749)	1.23 (.582-2.67)	2522
Males (2011 - 2012)	*	< LOD	.148 (.095-.237)	.571 (.366-.866)	1.48 (.882-2.41)	1355
Males (2013 - 2014)	*	< LOD	.077 (.061-.092)	.331 (.197-.479)	.850 (.477-2.45)	1526
Males (2015 - 2016)	*	< LOD	.100 (.066-.164)	.400 (.252-.900)	1.61 (.900-3.09)	1516
Females (2011 - 2012)	*	< LOD	.139 (.095-.212)	.823 (.376-1.29)	3.49 (1.25-9.21)	1354
Females (2013 - 2014)	*	< LOD	.072 (.045-.119)	.286 (.189-.524)	1.14 (.563-2.38)	1646
Females (2015 - 2016)	*	< LOD	.097 (.058-.181)	.403 (.232-.787)	1.22 (.528-2.71)	1551
Mexican Americans (2011 - 2012)	*	.045 (<LOD-.114)	.217 (.093-.387)	.870 (.416-2.41)	2.66 (1.25-6.56)	290
Mexican Americans (2013 - 2014)	*	< LOD	.129 (.067-.277)	.781 (.321-1.88)	2.08 (.971-5.07)	501
Mexican Americans (2015 - 2016)	.130 (.083-.206)	.071 (<LOD-.183)	.309 (.131-.817)	2.06 (.904-4.35)	6.13 (3.42-15.4)	556
Non-Hispanic blacks (2011 - 2012)	.188 (.123-.289)	.133 (.075-.230)	.455 (.253-.898)	1.95 (.962-4.42)	7.48 (3.39-18.0)	700
Non-Hispanic blacks (2013 - 2014)	.129 (.084-.197)	.080 (.040-.143)	.272 (.167-.521)	2.25 (.616-6.23)	6.89 (2.78-16.7)	607
Non-Hispanic blacks (2015 - 2016)	.191 (.128-.286)	.122 (.077-.201)	.545 (.296-1.01)	3.23 (1.23-9.31)	12.3 (3.27-35.8)	636
Non-Hispanic whites (2011 - 2012)	*	< LOD	.083 (.061-.122)	.290 (.198-.531)	1.01 (.496-1.57)	946
Non-Hispanic whites (2013 - 2014)	*	< LOD	.047 (<LOD-.066)	.147 (.097-.200)	.357 (.197-.566)	1290
Non-Hispanic whites (2015 - 2016)	*	< LOD	.053 (<LOD-.073)	.164 (.109-.246)	.353 (.206-.536)	995
All Hispanics (2011 - 2012)	.124 (.083-.186)	.071 (<LOD-.182)	.294 (.182-.586)	1.46 (.882-2.41)	4.50 (2.02-8.83)	576
All Hispanics (2013 - 2014)	*	< LOD	.126 (.077-.252)	.757 (.346-1.94)	2.53 (.946-6.19)	804
All Hispanics (2015 - 2016)	.131 (.089-.195)	.076 (.040-.139)	.322 (.171-.638)	2.01 (.815-4.97)	7.17 (2.06-19.3)	962
Asians (2011 - 2012)	*	.050 (<LOD-.100)	.223 (.102-.666)	1.36 (.706-2.33)	3.39 (1.49-12.0)	405
Asians (2013 - 2014)	*	< LOD	.116 (.085-.163)	.503 (.240-.992)	1.50 (.754-2.70)	361
Asians (2015 - 2016)	*	< LOD	.120 (.067-.232)	.503 (.202-1.66)	1.68 (.511-4.21)	347

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.040, 0.040, and 0.040 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood 1,4-Dioxane (2009 – 2010)

CAS Number 123-91-1

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2474
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	414
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1369
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	691
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1217
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1257
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	429
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	428
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1202

Limit of detection (LOD, see Data Analysis section) for Survey year 09-10 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 1,4-Dioxane (2011 – 2016)

CAS Number 123-91-1

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2793
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3125
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2950
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	521
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	593
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	526
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2272
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2532
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2424
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1398
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1505
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1459
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1395
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1620
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1491
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	300
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	503
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	512
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	734
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	599
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	626
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	975
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1260
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	974
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	585
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	802
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	887
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	415
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	356
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	340

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.500, 0.500, and 0.500 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood 2,5-Dimethylfuran (2003 – 2010)

CAS Number 625-86-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	.016 (<LOD-.032)	.100 (.083-.110)	.140 (.120-.180)	1213
Total population (2005 - 2006)	*	< LOD	< LOD	.100 (.069-.120)	.160 (.130-.180)	3160
Total population (2007 - 2008)	*	< LOD	< LOD	.087 (.056-.118)	.148 (.129-.168)	2745
Total population (2009 - 2010)	*	< LOD	< LOD	.101 (.067-.129)	.171 (.138-.206)	3332
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.013 (<LOD-.029)	.049 (.020-.069)	930
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.028 (<LOD-.077)	449
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	.034 (<LOD-.065)	570
Age 20-59 years (2003 - 2004)	*	< LOD	.016 (<LOD-.032)	.100 (.083-.110)	.140 (.120-.180)	1213
Age 20-59 years (2005 - 2006)	*	< LOD	.013 (<LOD-.035)	.120 (.097-.144)	.170 (.140-.210)	1553
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	.113 (.079-.146)	.169 (.147-.209)	1471
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	.127 (.091-.160)	.197 (.159-.241)	1825
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	.069 (.027-.100)	.140 (.106-.160)	677
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	.014 (<LOD-.061)	.086 (.061-.137)	825
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	.032 (<LOD-.105)	.127 (.097-.179)	937
Males (2003 - 2004)	*	< LOD	.019 (<LOD-.034)	.094 (.071-.110)	.130 (.110-.190)	598
Males (2005 - 2006)	*	< LOD	< LOD	.110 (.079-.130)	.160 (.130-.190)	1490
Males (2007 - 2008)	*	< LOD	< LOD	.101 (.056-.130)	.154 (.133-.187)	1358
Males (2009 - 2010)	*	< LOD	< LOD	.117 (.079-.149)	.189 (.143-.245)	1640
Females (2003 - 2004)	*	< LOD	.012 (<LOD-.048)	.110 (.071-.120)	.150 (.120-.210)	615
Females (2005 - 2006)	*	< LOD	< LOD	.094 (.062-.120)	.158 (.120-.180)	1670
Females (2007 - 2008)	*	< LOD	< LOD	.081 (.042-.110)	.142 (.101-.176)	1387
Females (2009 - 2010)	*	< LOD	< LOD	.087 (.050-.109)	.150 (.112-.186)	1692
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.012 (<LOD-.020)	.038 (.013-.054)	237
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.015 (<LOD-.029)	.033 (.020-.055)	778
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.012 (<LOD-.019)	.032 (.019-.048)	557
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.020 (<LOD-.037)	.062 (.041-.071)	676
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.042 (.019-.063)	.110 (.079-.170)	.170 (.099-.220)	258
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.012 (<LOD-.030)	.085 (.058-.110)	.130 (.095-.180)	825
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.081 (.058-.102)	.148 (.093-.160)	557
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.103 (.061-.123)	.146 (.105-.197)	598
Non-Hispanic whites (2003 - 2004)	*	< LOD	.021 (<LOD-.043)	.110 (.087-.120)	.150 (.120-.200)	624
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	.118 (.091-.140)	.170 (.140-.230)	1325
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.111 (.077-.142)	.165 (.146-.191)	1215
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.122 (.092-.155)	.196 (.156-.240)	1494

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.012, 0.011, 0.011, and 0.011 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/25-Dimethylfuran_BiomonitoringSummary.html

Blood 2,5-Dimethylfuran (2011 – 2016)

CAS Number 625-86-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	.081 (.053-.099)	.142 (.129-.166)	2812
Total population (2013 - 2014)	*	< LOD	< LOD	.086 (.068-.103)	.148 (.124-.167)	3203
Total population (2015 - 2016)	*	< LOD	< LOD	.074 (.048-.097)	.152 (.118-.172)	3083
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	.028 (<LOD-.039)	527
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.031 (<LOD-.106)	599
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	546
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	.095 (.074-.110)	.152 (.136-.178)	2285
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.092 (.080-.108)	.155 (.133-.174)	2604
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	.088 (.061-.114)	.160 (.130-.191)	2537
Males (2011 - 2012)	*	< LOD	< LOD	.082 (.054-.099)	.134 (.122-.163)	1406
Males (2013 - 2014)	*	< LOD	< LOD	.088 (.054-.113)	.153 (.115-.181)	1545
Males (2015 - 2016)	*	< LOD	< LOD	.091 (.057-.126)	.160 (.129-.188)	1526
Females (2011 - 2012)	*	< LOD	< LOD	.077 (.048-.101)	.148 (.117-.210)	1406
Females (2013 - 2014)	*	< LOD	< LOD	.085 (.062-.104)	.142 (.116-.158)	1658
Females (2015 - 2016)	*	< LOD	< LOD	.057 (.035-.079)	.130 (.101-.165)	1557
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	.025 (<LOD-.049)	.061 (.037-.095)	300
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	.031 (.019-.058)	505
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	.021 (<LOD-.041)	.062 (.037-.126)	555
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	.073 (.046-.093)	.114 (.095-.145)	740
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.020 (<LOD-.040)	.107 (.087-.125)	.157 (.127-.184)	614
Non-Hispanic blacks (2015 - 2016)	*	< LOD	.017 (<LOD-.032)	.106 (.085-.128)	.165 (.138-.206)	640
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	.100 (.081-.125)	.168 (.139-.198)	974
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.097 (.075-.122)	.165 (.142-.189)	1305
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	.086 (.036-.131)	.163 (.130-.229)	999
All Hispanics (2011 - 2012)	*	< LOD	< LOD	.022 (<LOD-.037)	.065 (.043-.099)	598
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.016 (<LOD-.035)	.062 (.032-.101)	810
All Hispanics (2015 - 2016)	*	< LOD	< LOD	.019 (<LOD-.042)	.071 (.041-.107)	968
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	.025 (<LOD-.051)	416
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.039 (<LOD-.101)	364
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	.056 (<LOD-.117)	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.011, 0.011, and 0.011 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/2,5-Dimethylfuran_BiomonitoringSummary.html

Blood Benzene (2001 – 2010)

CAS Number 71-43-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	*	.030 (<LOD-.050)	.100 (.060-.140)	.190 (.140-.290)	.320 (.190-.480)	837
Total population (2003 - 2004)	*	.027 (.025-.031)	.064 (.050-.084)	.170 (.150-.190)	.260 (.210-.320)	1345
Total population (2005 - 2006)	*	.026 (<LOD-.030)	.056 (.047-.072)	.220 (.157-.260)	.310 (.264-.370)	3091
Total population (2007 - 2008)	*	< LOD	.041 (.028-.062)	.198 (.156-.246)	.294 (.246-.380)	2685
Total population (2009 - 2010)	*	< LOD	.035 (.026-.049)	.198 (.154-.234)	.307 (.262-.351)	3236
Age 12-19 years (2005 - 2006)	*	.024 (<LOD-.028)	.039 (.031-.056)	.089 (.066-.110)	.120 (.092-.180)	912
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	.053 (.029-.088)	.106 (.056-.159)	426
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	.047 (.027-.085)	.112 (.063-.205)	546
Age 20-59 years (2001 - 2002)	*	.030 (<LOD-.050)	.100 (.060-.140)	.190 (.140-.290)	.320 (.190-.480)	837
Age 20-59 years (2003 - 2004)	*	.027 (.025-.031)	.064 (.050-.084)	.170 (.150-.190)	.260 (.210-.320)	1345
Age 20-59 years (2005 - 2006)	*	.028 (.025-.032)	.072 (.053-.100)	.240 (.200-.290)	.340 (.300-.390)	1513
Age 20-59 years (2007 - 2008)	*	< LOD	.075 (.037-.126)	.243 (.187-.290)	.328 (.280-.416)	1445
Age 20-59 years (2009 - 2010)	*	< LOD	.054 (.040-.088)	.233 (.180-.288)	.340 (.288-.417)	1776
Age 60+ years (2005 - 2006)	*	< LOD	.042 (.036-.048)	.180 (.100-.230)	.270 (.200-.340)	666
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	.120 (.065-.158)	.213 (.150-.279)	814
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	.108 (.048-.177)	.224 (.135-.328)	914
Males (2001 - 2002)	*	.030 (<LOD-.050)	.110 (.060-.160)	.230 (.150-.370)	.370 (.210-.510)	403
Males (2003 - 2004)	.039 (.035-.043)	.030 (.027-.035)	.069 (.053-.084)	.160 (.140-.180)	.240 (.190-.320)	654
Males (2005 - 2006)	*	.028 (.025-.032)	.066 (.051-.083)	.230 (.165-.280)	.330 (.260-.440)	1459
Males (2007 - 2008)	*	< LOD	.056 (.036-.095)	.216 (.172-.274)	.303 (.252-.398)	1330
Males (2009 - 2010)	*	< LOD	.045 (.034-.060)	.225 (.177-.272)	.326 (.273-.421)	1602
Females (2001 - 2002)	*	.030 (<LOD-.050)	.100 (.060-.130)	.180 (.120-.240)	.250 (.170-.330)	434
Females (2003 - 2004)	*	.025 (<LOD-.029)	.057 (.040-.090)	.180 (.150-.220)	.290 (.220-.420)	691
Females (2005 - 2006)	*	.024 (<LOD-.028)	.049 (.040-.067)	.200 (.150-.230)	.290 (.250-.340)	1632
Females (2007 - 2008)	*	< LOD	.030 (<LOD-.045)	.182 (.109-.240)	.285 (.220-.368)	1355
Females (2009 - 2010)	*	< LOD	.027 (<LOD-.042)	.166 (.105-.214)	.279 (.215-.331)	1634

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.024, 0.024, 0.024, 0.024, and 0.024, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Blood Benzene (2001 – 2010)

CAS Number 71-43-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	*	.030 (<LOD-.070)	.070 (.030-.170)	.140 (.060-.360)	.230 (.130-.370)	227
Mexican Americans (2003 - 2004)	*	.027 (<LOD-.035)	.041 (.034-.057)	.077 (.058-.110)	.130 (.084-.320)	254
Mexican Americans (2005 - 2006)	*	< LOD	.036 (.031-.045)	.060 (.048-.086)	.096 (.072-.140)	744
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.053 (.038-.076)	.092 (.056-.120)	522
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.061 (.041-.086)	.141 (.093-.199)	646
Non-Hispanic blacks (2001 - 2002)	*	< LOD	.060 (<LOD-.160)	.180 (.090-.300)	.250 (.160-.480)	137
Non-Hispanic blacks (2003 - 2004)	.043 (.033-.058)	.029 (<LOD-.054)	.092 (.055-.140)	.210 (.140-.290)	.320 (.240-.460)	302
Non-Hispanic blacks (2005 - 2006)	*	.026 (<LOD-.034)	.077 (.051-.110)	.180 (.150-.221)	.280 (.220-.360)	812
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.075 (.056-.093)	.180 (.136-.284)	.318 (.240-.512)	556
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.050 (.028-.081)	.212 (.142-.311)	.365 (.262-.480)	578
Non-Hispanic whites (2001 - 2002)	*	.030 (<LOD-.060)	.110 (.070-.160)	.210 (.140-.340)	.330 (.190-.510)	411
Non-Hispanic whites (2003 - 2004)	*	.028 (.025-.033)	.068 (.053-.088)	.180 (.150-.200)	.280 (.210-.330)	687
Non-Hispanic whites (2005 - 2006)	*	.027 (<LOD-.031)	.069 (.049-.091)	.240 (.190-.280)	.330 (.270-.390)	1309
Non-Hispanic whites (2007 - 2008)	*	< LOD	.051 (.028-.107)	.226 (.182-.276)	.313 (.276-.388)	1210
Non-Hispanic whites (2009 - 2010)	*	< LOD	.041 (.031-.055)	.224 (.178-.263)	.326 (.290-.390)	1479

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.024, 0.024, 0.024, 0.024, and 0.024, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Blood Benzene (2011 – 2016)

CAS Number 71-43-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	.027 (<LOD-.036)	.159 (.121-.206)	.277 (.225-.328)	2671
Total population (2013 - 2014)	*	< LOD	.027 (<LOD-.042)	.180 (.159-.200)	.285 (.239-.310)	3094
Total population (2015 - 2016)	*	< LOD	.045 (.037-.054)	.148 (.120-.172)	.251 (.215-.294)	3038
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	.043 (.029-.058)	.086 (.052-.143)	501
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.057 (.030-.088)	.148 (.059-.216)	589
Age 12-19 years (2015 - 2016)	*	< LOD	.029 (.025-.037)	.054 (.041-.068)	.071 (.059-.089)	538
Age 20+ years (2011 - 2012)	*	< LOD	.031 (<LOD-.045)	.178 (.137-.221)	.284 (.238-.348)	2170
Age 20+ years (2013 - 2014)	*	< LOD	.033 (<LOD-.052)	.194 (.167-.214)	.295 (.250-.315)	2505
Age 20+ years (2015 - 2016)	*	< LOD	.048 (.039-.059)	.169 (.132-.199)	.271 (.230-.340)	2500
Males (2011 - 2012)	*	< LOD	.033 (<LOD-.056)	.162 (.128-.202)	.272 (.227-.310)	1340
Males (2013 - 2014)	*	< LOD	.032 (<LOD-.043)	.195 (.166-.217)	.298 (.236-.339)	1494
Males (2015 - 2016)	*	< LOD	.050 (.040-.062)	.171 (.129-.209)	.262 (.230-.340)	1508
Females (2011 - 2012)	*	< LOD	< LOD	.150 (.106-.214)	.279 (.198-.398)	1331
Females (2013 - 2014)	*	< LOD	< LOD	.162 (.145-.186)	.259 (.232-.295)	1600
Females (2015 - 2016)	*	< LOD	.040 (.031-.052)	.127 (.099-.144)	.216 (.178-.310)	1530
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	.080 (.055-.110)	.138 (.074-.222)	282
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.039 (<LOD-.068)	.107 (.038-.199)	502
Mexican Americans (2015 - 2016)	*	< LOD	.045 (.033-.059)	.079 (.062-.105)	.154 (.094-.188)	537
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.034 (<LOD-.065)	.146 (.113-.175)	.244 (.175-.301)	715
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.074 (.039-.107)	.210 (.182-.249)	.327 (.250-.444)	595
Non-Hispanic blacks (2015 - 2016)	*	< LOD	.062 (.045-.087)	.222 (.172-.259)	.357 (.252-.449)	632
Non-Hispanic whites (2011 - 2012)	*	< LOD	.031 (<LOD-.056)	.198 (.148-.239)	.310 (.232-.383)	908
Non-Hispanic whites (2013 - 2014)	*	< LOD	.036 (<LOD-.071)	.205 (.165-.244)	.299 (.253-.339)	1239
Non-Hispanic whites (2015 - 2016)	*	< LOD	.045 (.036-.057)	.166 (.119-.208)	.275 (.215-.347)	989
All Hispanics (2011 - 2012)	*	< LOD	< LOD	.070 (.048-.095)	.138 (.091-.206)	572
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.049 (.029-.123)	.150 (.108-.203)	800
All Hispanics (2015 - 2016)	*	< LOD	.045 (.033-.054)	.079 (.063-.111)	.154 (.105-.184)	947
Asians (2011 - 2012)	*	< LOD	< LOD	.030 (<LOD-.038)	.053 (.034-.115)	396
Asians (2013 - 2014)	*	< LOD	< LOD	.035 (<LOD-.078)	.084 (.036-.139)	357
Asians (2015 - 2016)	*	< LOD	.025 (<LOD-.046)	.064 (.045-.077)	.091 (.064-.154)	344

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.024, 0.024, and 0.024 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Blood Benzonitrile (2013 – 2016)

CAS Number 100-47-0

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3094
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3028
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	589
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	537
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2505
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	.150 (<LOD-.180)	2491
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1494
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	.162 (<LOD-.221)	1500
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1600
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1528
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	502
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	532
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	595
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	.198 (<LOD-.270)	.322 (.223-.568)	634
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1239
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	988
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	800
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	935
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	357
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	345

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.150 and 0.150 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Chlorobenzene (Monochlorobenzene) (2003 – 2010)

CAS Number 108-90-7

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1366
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3072
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2749
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3236
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	910
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	434
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	561
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1366
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1495
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1487
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1775
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	667
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	828
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	900
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	669
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1453
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1358
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1591
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	697
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1619
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1391
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1645
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	740
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	524
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	300
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	817
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	585
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	694
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1287
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1227
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1432

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.011, 0.011, 0.011, and 0.011 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood Chlorobenzene (Monochlorobenzene) (2011 – 2016)

CAS Number 108-90-7

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2797
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3203
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3070
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	525
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	599
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	543
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2272
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2604
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2527
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1402
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1545
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1516
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1395
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1658
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1554
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	294
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	504
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	557
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	743
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	629
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	970
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1305
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	996
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	589
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	809
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	970
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	411
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	364
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.011, 0.011, and 0.011 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Chlorobenzenes_BiomonitoringSummary.html

Blood Chloroethane (2013 – 2016)

CAS Number 75-00-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3194
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3042
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	597
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	532
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2597
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2510
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1539
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1510
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1655
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1532
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	504
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	546
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	614
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	633
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1299
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	983
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	809
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	957
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	362
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	345

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.045 and 0.045 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Cyclohexane (2013 – 2016)

CAS Number 110-82-7

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3004
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2965
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	559
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	528
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2445
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2437
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1458
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1471
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1546
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1494
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	442
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	526
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	585
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	632
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1249
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	958
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	727
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	908
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	338
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	343

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.020 and 0.020 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Dibromomethane (2003 – 2010)

CAS Number 74-95-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1355
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3152
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2712
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3243
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	929
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	427
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	562
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1355
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1554
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1461
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1779
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	669
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	824
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	902
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	666
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1494
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1345
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1594
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	689
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1658
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1367
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1649
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	778
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	510
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	674
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	292
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	816
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	556
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	693
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1324
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1236
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1433

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.03, 0.03, 0.03, and 0.03 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood Dibromomethane (2011 – 2012)‡

CAS Number 74-95-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2750
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	508
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2242
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1369
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1381
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	298
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	732
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	947
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	588
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	400

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.03.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result. .

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood Dichloromethane (Methylene chloride) (2003 – 2010)

CAS Number 75-09-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1165
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2852
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2569
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2878
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	837
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	416
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	489
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1165
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1400
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1369
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1601
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	615
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	784
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	788
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	568
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1338
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1279
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1404
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	597
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1514
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1290
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1474
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	225
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	731
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	521
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	575
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	245
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	729
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	476
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	560
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	607
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1186
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1154
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1278

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.07, 0.25, 0.25, and 0.25 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Dichloromethane (Methylene chloride) (2011 – 2016)

CAS Number 75-09-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2559
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3143
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3027
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	489
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	588
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	540
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2070
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2555
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2487
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1294
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1515
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1494
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1265
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1628
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1533
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	281
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	501
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	546
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	674
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	608
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	628
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	879
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1269
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	985
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	526
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	798
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	948
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	400
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	359
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	339

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.250, 0.250, and 0.250 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Diethyl ether (2013 – 2016)

CAS Number 60-29-7

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3041
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3029
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	565
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	527
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2476
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2502
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1472
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1503
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1569
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1526
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	479
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	557
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	573
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	620
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1247
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	980
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	773
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	968
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	340
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	338

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.040 and 0.040 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Ethyl acetate (2013 – 2016)

CAS Number 141-78-6

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3140
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2965
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	588
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	524
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2552
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2441
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1512
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1471
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1628
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1494
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	482
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	508
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	605
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	624
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1292
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	972
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	784
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	908
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	351
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	337

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.158 and 0.158 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Ethylbenzene (2001 – 2010)

CAS Number 100-41-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	.034 (.029-.039)	.030 (.030-.040)	.050 (.050-.070)	.090 (.070-.120)	.140 (.090-.180)	879
Total population (2003 - 2004)	.035 (.033-.037)	.032 (.030-.036)	.053 (.048-.057)	.083 (.077-.088)	.110 (.098-.120)	1299
Total population (2005 - 2006)	.038 (.036-.041)	.035 (.033-.037)	.059 (.052-.067)	.100 (.093-.114)	.140 (.122-.160)	3119
Total population (2007 - 2008)	*	< LOD	.038 (.031-.047)	.083 (.071-.098)	.122 (.099-.143)	2750
Total population (2009 - 2010)	*	< LOD	.047 (.038-.059)	.114 (.090-.145)	.175 (.133-.250)	3209
Age 12-19 years (2005 - 2006)	.032 (.030-.034)	.031 (.029-.033)	.046 (.042-.049)	.070 (.058-.085)	.096 (.075-.120)	909
Age 12-19 years (2007 - 2008)	*	< LOD	.026 (<LOD-.035)	.051 (.036-.059)	.068 (.057-.090)	448
Age 12-19 years (2009 - 2010)	*	< LOD	.028 (<LOD-.032)	.055 (.041-.071)	.082 (.065-.117)	550
Age 20-59 years (2001 - 2002)	.034 (.029-.039)	.030 (.030-.040)	.050 (.050-.070)	.090 (.070-.120)	.140 (.090-.180)	879
Age 20-59 years (2003 - 2004)	.035 (.033-.037)	.032 (.030-.036)	.053 (.048-.057)	.083 (.077-.088)	.110 (.098-.120)	1299
Age 20-59 years (2005 - 2006)	.040 (.037-.043)	.037 (.034-.039)	.062 (.054-.073)	.110 (.098-.126)	.150 (.130-.180)	1539
Age 20-59 years (2007 - 2008)	*	< LOD	.045 (.036-.056)	.094 (.077-.114)	.131 (.112-.160)	1473
Age 20-59 years (2009 - 2010)	*	< LOD	.058 (.044-.075)	.129 (.104-.166)	.189 (.149-.518)	1767
Age 60+ years (2005 - 2006)	.037 (.033-.040)	.033 (.030-.036)	.056 (.046-.068)	.098 (.090-.110)	.130 (.110-.160)	671
Age 60+ years (2007 - 2008)	*	< LOD	.032 (.026-.038)	.062 (.050-.083)	.100 (.074-.123)	829
Age 60+ years (2009 - 2010)	*	< LOD	.041 (.032-.050)	.086 (.067-.116)	.139 (.108-.186)	892
Males (2001 - 2002)	.035 (.029-.041)	.030 (<LOD-.040)	.060 (.040-.070)	.100 (.070-.150)	.150 (.090-.220)	419
Males (2003 - 2004)	.037 (.034-.041)	.036 (.031-.040)	.057 (.051-.065)	.086 (.078-.099)	.110 (.094-.130)	625
Males (2005 - 2006)	.042 (.039-.044)	.038 (.036-.041)	.067 (.057-.074)	.114 (.099-.131)	.160 (.136-.180)	1474
Males (2007 - 2008)	*	< LOD	.044 (.037-.056)	.090 (.077-.105)	.128 (.102-.154)	1356
Males (2009 - 2010)	*	< LOD	.055 (.045-.070)	.127 (.099-.168)	.189 (.156-.342)	1582
Females (2001 - 2002)	.033 (.028-.038)	.030 (.030-.040)	.050 (.040-.060)	.080 (.060-.120)	.130 (.070-.180)	460
Females (2003 - 2004)	.032 (.030-.034)	.030 (.027-.033)	.048 (.041-.053)	.081 (.071-.089)	.100 (.091-.120)	674
Females (2005 - 2006)	.035 (.032-.038)	.032 (.029-.035)	.052 (.047-.061)	.093 (.081-.103)	.120 (.106-.150)	1645
Females (2007 - 2008)	*	< LOD	.032 (.027-.043)	.074 (.058-.092)	.116 (.089-.134)	1394
Females (2009 - 2010)	*	< LOD	.040 (.031-.054)	.099 (.076-.122)	.153 (.114-.236)	1627

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.024, 0.024, 0.024, 0.024, and 0.024, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

Blood Ethylbenzene (2001 – 2010)

CAS Number 100-41-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	*	.030 (<LOD-.040)	.040 (.040-.060)	.070 (.050-.110)	.120 (.070-.210)	220
Mexican Americans (2003 - 2004)	.031 (.027-.036)	.029 (<LOD-.035)	.044 (.035-.048)	.064 (.051-.074)	.091 (.066-.170)	253
Mexican Americans (2005 - 2006)	.032 (.028-.036)	.030 (.026-.036)	.047 (.039-.057)	.072 (.051-.093)	.086 (.073-.120)	752
Mexican Americans (2007 - 2008)	*	< LOD	.029 (.025-.036)	.050 (.040-.068)	.072 (.059-.100)	557
Mexican Americans (2009 - 2010)	*	< LOD	.035 (.027-.052)	.070 (.056-.096)	.114 (.078-.247)	626
Non-Hispanic blacks (2001 - 2002)	.032 (.027-.038)	.030 (<LOD-.040)	.050 (.030-.070)	.080 (.060-.130)	.130 (.070-.240)	159
Non-Hispanic blacks (2003 - 2004)	.032 (.027-.038)	.030 (<LOD-.037)	.050 (.037-.066)	.079 (.065-.100)	.110 (.084-.130)	281
Non-Hispanic blacks (2005 - 2006)	.037 (.035-.040)	.034 (.030-.038)	.057 (.052-.064)	.095 (.085-.100)	.120 (.104-.140)	809
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.048 (.037-.053)	.086 (.066-.105)	.117 (.089-.170)	559
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.047 (.030-.083)	.137 (.075-.215)	.215 (.097-1.52)	583
Non-Hispanic whites (2001 - 2002)	.035 (.029-.043)	.030 (<LOD-.040)	.060 (.050-.070)	.090 (.070-.140)	.150 (.090-.190)	432
Non-Hispanic whites (2003 - 2004)	.036 (.034-.038)	.034 (.030-.038)	.055 (.050-.061)	.087 (.081-.092)	.110 (.098-.130)	669
Non-Hispanic whites (2005 - 2006)	.039 (.037-.042)	.036 (.033-.038)	.061 (.053-.072)	.110 (.095-.120)	.150 (.125-.180)	1326
Non-Hispanic whites (2007 - 2008)	*	< LOD	.040 (.031-.053)	.090 (.075-.112)	.128 (.105-.154)	1190
Non-Hispanic whites (2009 - 2010)	*	< LOD	.054 (.042-.065)	.121 (.099-.151)	.180 (.145-.281)	1465

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.024, 0.024, 0.024, 0.024, and 0.024, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

Blood Ethylbenzene (2011 – 2016)

CAS Number 100-41-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	.029 (.025-.034)	.074 (.059-.090)	.115 (.102-.125)	2657
Total population (2013 - 2014)	*	< LOD	.029 (<LOD-.034)	.074 (.065-.083)	.118 (.098-.143)	3077
Total population (2015 - 2016)	*	< LOD	.028 (.024-.031)	.077 (.066-.087)	.114 (.104-.125)	3059
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	.040 (.036-.044)	.046 (.044-.070)	502
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.032 (.025-.041)	.060 (.034-.095)	576
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	.029 (.025-.036)	.048 (.036-.057)	541
Age 20+ years (2011 - 2012)	*	< LOD	.030 (.026-.036)	.080 (.067-.095)	.117 (.104-.140)	2155
Age 20+ years (2013 - 2014)	*	< LOD	.032 (.026-.038)	.079 (.069-.092)	.124 (.106-.150)	2501
Age 20+ years (2015 - 2016)	*	< LOD	.029 (.026-.035)	.083 (.070-.094)	.120 (.112-.135)	2518
Males (2011 - 2012)	*	< LOD	.034 (.029-.039)	.080 (.067-.095)	.117 (.106-.145)	1331
Males (2013 - 2014)	*	< LOD	.031 (.027-.036)	.079 (.063-.101)	.135 (.106-.159)	1486
Males (2015 - 2016)	*	< LOD	.032 (.028-.038)	.086 (.073-.097)	.126 (.111-.153)	1513
Females (2011 - 2012)	*	< LOD	.025 (<LOD-.030)	.064 (.051-.085)	.107 (.085-.125)	1326
Females (2013 - 2014)	*	< LOD	< LOD	.068 (.062-.077)	.107 (.092-.124)	1591
Females (2015 - 2016)	*	< LOD	< LOD	.067 (.052-.081)	.109 (.088-.119)	1546
Mexican Americans (2011 - 2012)	*	< LOD	.024 (<LOD-.030)	.050 (.031-.068)	.078 (.041-.415)	276
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.040 (.032-.051)	.064 (.047-.092)	491
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	.051 (.036-.058)	.085 (.057-.096)	556
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.029 (.025-.035)	.063 (.054-.076)	.097 (.076-.113)	688
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.044 (.032-.055)	.088 (.074-.095)	.125 (.102-.143)	590
Non-Hispanic blacks (2015 - 2016)	*	< LOD	.038 (.030-.054)	.094 (.069-.120)	.130 (.109-.155)	632
Non-Hispanic whites (2011 - 2012)	*	< LOD	.031 (.027-.038)	.085 (.071-.097)	.118 (.108-.140)	937
Non-Hispanic whites (2013 - 2014)	*	< LOD	.032 (.025-.040)	.083 (.066-.106)	.140 (.107-.169)	1241
Non-Hispanic whites (2015 - 2016)	*	< LOD	.029 (.024-.034)	.084 (.070-.095)	.117 (.108-.144)	991
All Hispanics (2011 - 2012)	*	< LOD	< LOD	.049 (.035-.062)	.086 (.051-.124)	552
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.046 (.033-.060)	.072 (.062-.092)	789
All Hispanics (2015 - 2016)	*	< LOD	< LOD	.055 (.039-.067)	.093 (.068-.100)	961
Asians (2011 - 2012)	*	< LOD	< LOD	.030 (.026-.037)	.042 (.034-.055)	400
Asians (2013 - 2014)	*	< LOD	< LOD	.036 (.025-.052)	.054 (.036-.076)	351
Asians (2015 - 2016)	*	< LOD	< LOD	.029 (<LOD-.042)	.047 (.032-.070)	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.024, 0.024, and 0.024 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

Blood Furan (2007 – 2010)

CAS Number 110-00-9

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	.042 (<LOD-.065)	.089 (.068-.106)	2758
Total population (2009 - 2010)	*	< LOD	< LOD	.060 (.044-.078)	.103 (.081-.127)	3167
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	450
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	.034 (<LOD-.065)	544
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	.066 (.032-.088)	.099 (.082-.128)	1455
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	.075 (.051-.094)	.115 (.087-.150)	1737
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	.052 (<LOD-.084)	853
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	.032 (<LOD-.063)	.081 (.060-.106)	886
Males (2007 - 2008)	*	< LOD	< LOD	.051 (<LOD-.074)	.091 (.062-.121)	1367
Males (2009 - 2010)	*	< LOD	< LOD	.072 (.049-.086)	.115 (.083-.155)	1570
Females (2007 - 2008)	*	< LOD	< LOD	.038 (<LOD-.063)	.087 (.050-.102)	1391
Females (2009 - 2010)	*	< LOD	< LOD	.051 (.034-.070)	.091 (.070-.109)	1597
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	540
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	.032 (.026-.047)	658
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.039 (.026-.050)	.083 (.050-.099)	575
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.059 (.033-.106)	.107 (.078-.129)	555
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.056 (<LOD-.083)	.098 (.080-.124)	1206
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.075 (.057-.090)	.115 (.092-.136)	1403

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 and 09-10 are 0.025 and 0.025, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Furan (2011 – 2016)

CAS Number 110-00-9

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	.044 (.031-.060)	.088 (.074-.105)	2616
Total population (2013 - 2014)	*	< LOD	< LOD	.050 (.037-.063)	.091 (.074-.103)	3203
Total population (2013 - 2014)	*	< LOD	< LOD	.050 (.037-.063)	.091 (.074-.103)	3203
Total population (2015 - 2016)	*	< LOD	< LOD	.042 (.032-.057)	.080 (.069-.097)	3089
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	.026 (<LOD-.046)	494
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.032 (<LOD-.066)	599
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.032 (<LOD-.066)	599
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	546
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	.049 (.036-.066)	.097 (.080-.108)	2122
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.056 (.044-.068)	.095 (.082-.106)	2604
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	.056 (.044-.068)	.095 (.082-.106)	2604
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	.050 (.037-.067)	.091 (.076-.110)	2543
Males (2011 - 2012)	*	< LOD	< LOD	.045 (.033-.065)	.087 (.067-.105)	1306
Males (2013 - 2014)	*	< LOD	< LOD	.052 (.032-.070)	.092 (.070-.114)	1545
Males (2013 - 2014)	*	< LOD	< LOD	.052 (.032-.070)	.092 (.070-.114)	1545
Males (2015 - 2016)	*	< LOD	< LOD	.053 (.036-.069)	.091 (.072-.105)	1527
Females (2011 - 2012)	*	< LOD	< LOD	.043 (.026-.058)	.088 (.064-.116)	1310
Females (2013 - 2014)	*	< LOD	< LOD	.050 (.036-.064)	.091 (.066-.108)	1658
Females (2013 - 2014)	*	< LOD	< LOD	.050 (.036-.064)	.091 (.066-.108)	1658
Females (2015 - 2016)	*	< LOD	< LOD	.034 (<LOD-.048)	.079 (.056-.107)	1562
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	.036 (<LOD-.051)	285
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	504
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	504
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	.034 (<LOD-.066)	558
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	.034 (.028-.046)	.070 (.046-.079)	699
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.068 (.052-.073)	.093 (.074-.109)	615
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	.068 (.052-.073)	.093 (.074-.109)	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	.067 (.049-.080)	.100 (.080-.123)	641
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	.060 (.038-.074)	.109 (.088-.121)	896
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.058 (.042-.075)	.103 (.083-.119)	1305
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.058 (.042-.075)	.103 (.083-.119)	1305
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	.051 (.031-.070)	.091 (.072-.116)	1001
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	.042 (<LOD-.060)	555
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	.042 (<LOD-.054)	809
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	.042 (<LOD-.054)	809
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	.039 (<LOD-.067)	971
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	386
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.028 (<LOD-.054)	364
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	.028 (<LOD-.054)	364
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	.027 (<LOD-.049)	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.025, 0.025, and 0.025 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Heptane (2013 – 2016)

CAS Number 142-82-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3099
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2991
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	575
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	531
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2524
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2460
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1497
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1474
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1602
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1517
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	471
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	531
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	592
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	634
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1279
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	954
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	769
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	938
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	350
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	340

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.100 and 0.100 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Hexachloroethane (2003 – 2010)

CAS Number 67-72-1

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1366
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3155
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2627
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	2652
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	930
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	419
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	458
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1366
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1547
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1417
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1434
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	678
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	791
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	760
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	669
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1495
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1285
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1292
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	697
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1660
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1342
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1360
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	267
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	758
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	506
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	564
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	300
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	830
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	531
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	500
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	694
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1335
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1191
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1097

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.011, 0.011, 0.011, and 0.011 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Hexachloroethane_BiomonitoringSummary.html

Blood Hexachloroethane (2011 – 2012)‡

CAS Number 67-72-1

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2788
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	523
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2265
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1399
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1389
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	300
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	741
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	959
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	589
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	415

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 0.011.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

‡Not measured after Survey years 2011-2012.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Hexachloroethane_BiomonitoringSummary.html

Blood Hexane (2009 – 2010)

CAS Number 110-54-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3266
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	556
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1790
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	920
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1610
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1656
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	666
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1457

Limit of detection (LOD, see Data Analysis section) for Survey year 09-10 is 0.122.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Hexane (2011 – 2016)

CAS Number 110-54-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2640
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2927
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2840
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	500
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	549
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	504
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2140
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2378
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2336
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1319
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1423
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1408
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1321
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1504
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1432
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	271
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	444
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	508
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	708
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	586
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	909
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1208
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	934
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	563
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	722
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	869
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	381
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	331
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	330

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.122, 0.122, and 0.122 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Isobutyronitrile (2015 – 2016)

CAS Number 78-82-0

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	.053 (.042-.064)	2981
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	529
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	.056 (.046-.071)	2452
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	.056 (.044-.074)	1485
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	.048 (<LOD-.063)	1496
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	508
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	.046 (<LOD-.054)	.073 (.054-.106)	615
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	.056 (.042-.076)	987
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	912
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	342

Limit of detection (LOD, see Data Analysis section) for Survey year 15-16 is 0.040.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Isopropylbenzene (Cumene) (2007 – 2010)

CAS Number 98-82-8

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2752
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3250
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	448
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	561
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1479
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1768
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	825
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	921
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1369
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1591
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1383
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1659
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	518
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	671
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	544
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	576
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1251
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1445

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 and 09-10 are 0.04 and 0.04, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Isopropylbenzene (Cumene) (2011 – 2016)

CAS Number 98-82-8

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2762
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3204
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3058
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	521
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	599
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	541
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2241
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2605
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2517
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1387
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1546
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1513
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1375
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1658
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1545
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	294
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	505
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	549
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	735
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	628
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	953
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1305
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	995
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	587
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	810
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	961
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	406
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	364
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	348

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.040, 0.040, and 0.040 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Methyl-tert-Butyl Ether (MTBE) (2001 – 2008)‡

CAS Number 1634-04-4

Geometric mean and selected percentiles of whole blood concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	16.4 (4.77-56.7)	27.7 (7.29-64.9)	73.8 (35.5-127)	132 (64.0-278)	188 (109-339)	672
Total population (2003 - 2004)	11.0 (5.98-20.1)	10.0 (4.60-25.1)	45.0 (16.0-98.0)	110 (70.0-180)	170 (110-340)	1307
Total population (2005 - 2006)	6.16 (2.94-12.9)	4.60 (1.80-15.0)	20.0 (5.20-73.0)	75.0 (22.0-140)	110 (49.0-250)	3080
Total population (2007 - 2008)	*	< LOD	< LOD	3.50 (2.00-7.83)	7.27 (3.40-22.3)	2964
Age 12-19 years (2005 - 2006)	5.85 (2.61-13.1)	4.20 (1.40-18.0)	18.0 (4.60-75.0)	70.0 (18.0-140)	110 (62.0-180)	911
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	3.74 (1.90-8.47)	8.43 (3.10-19.0)	476
Age 20-59 years (2001 - 2002)	16.4 (4.77-56.7)	27.7 (7.29-64.9)	73.8 (35.5-127)	132 (64.0-278)	188 (109-339)	672
Age 20-59 years (2003 - 2004)	11.0 (5.98-20.1)	10.0 (4.60-25.1)	45.0 (16.0-98.0)	110 (70.0-180)	170 (110-340)	1307
Age 20-59 years (2005 - 2006)	6.26 (3.05-12.9)	4.80 (2.00-14.0)	20.0 (5.50-70.0)	71.0 (21.0-150)	110 (46.0-250)	1512
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	3.16 (1.90-5.10)	5.10 (2.87-19.0)	1597
Age 60+ years (2005 - 2006)	6.00 (2.67-13.5)	3.80 (1.60-14.0)	22.0 (4.00-94.0)	86.0 (19.0-180)	120 (55.0-290)	657
Age 60+ years (2007 - 2008)	*	< LOD	1.80 (<LOD-3.10)	6.00 (2.70-14.5)	14.0 (5.25-28.0)	891
Males (2001 - 2002)	16.9 (4.96-57.7)	27.9 (6.82-64.6)	75.0 (35.5-131)	132 (54.9-307)	167 (109-417)	334
Males (2003 - 2004)	12.2 (6.29-23.6)	11.0 (4.80-29.0)	55.0 (18.0-110)	130 (79.0-200)	200 (110-470)	641
Males (2005 - 2006)	6.24 (3.07-12.7)	4.60 (1.90-15.0)	20.0 (5.90-69.0)	73.0 (25.0-120)	110 (52.0-230)	1462
Males (2007 - 2008)	*	< LOD	1.40 (<LOD-2.21)	3.40 (1.93-8.40)	7.27 (3.00-26.0)	1481
Females (2001 - 2002)	16.0 (4.12-61.8)	26.6 (5.93-74.6)	72.7 (32.6-132)	142 (73.5-255)	194 (92.3-336)	338
Females (2003 - 2004)	9.88 (5.62-17.4)	8.90 (4.30-23.0)	38.0 (14.0-85.0)	94.0 (58.0-160)	140 (90.0-250)	666
Females (2005 - 2006)	6.08 (2.81-13.1)	4.50 (1.70-14.0)	19.0 (4.90-79.0)	76.0 (20.0-160)	110 (48.0-250)	1618
Females (2007 - 2008)	*	< LOD	< LOD	3.50 (1.90-8.40)	7.30 (3.60-16.5)	1483
Mexican Americans (2001 - 2002)	23.3 (4.96-110)	33.4 (2.92-187)	91.3 (26.1-255)	225 (80.6-339)	273 (182-358)	166
Mexican Americans (2003 - 2004)	11.6 (5.35-25.3)	12.0 (3.80-29.0)	32.0 (14.0-80.0)	80.0 (38.0-190)	160 (74.0-220)	245
Mexican Americans (2005 - 2006)	7.61 (2.99-19.3)	5.40 (2.00-33.0)	30.0 (4.60-90.0)	67.0 (26.0-190)	100 (45.0-330)	735
Mexican Americans (2007 - 2008)	*	< LOD	1.71 (<LOD-2.90)	4.10 (2.19-9.60)	8.80 (5.20-11.5)	559
Non-Hispanic blacks (2001 - 2002)	14.9 (6.11-36.4)	26.4 (3.11-55.6)	52.6 (30.0-86.8)	87.4 (38.6-155)	120 (70.0-155)	119
Non-Hispanic blacks (2003 - 2004)	9.63 (4.83-19.2)	10.0 (3.50-28.0)	32.8 (11.0-85.0)	77.0 (36.0-160)	140 (61.0-210)	285
Non-Hispanic blacks (2005 - 2006)	9.14 (3.16-26.5)	5.70 (1.80-50.0)	48.0 (5.00-150)	120 (46.0-280)	180 (88.0-460)	820
Non-Hispanic blacks (2007 - 2008)	*	< LOD	1.90 (<LOD-3.80)	3.50 (2.40-7.27)	5.80 (3.50-15.3)	587
Non-Hispanic whites (2001 - 2002)	16.0 (4.13-62.4)	27.9 (4.71-74.6)	72.7 (33.3-132)	132 (59.6-249)	165 (92.8-366)	333
Non-Hispanic whites (2003 - 2004)	11.5 (5.51-23.8)	11.0 (4.00-33.5)	59.0 (14.0-120)	120 (73.0-230)	180 (110-430)	673
Non-Hispanic whites (2005 - 2006)	5.55 (2.47-12.5)	4.00 (<LOD-15.0)	16.0 (4.30-75.0)	70.0 (15.0-150)	110 (40.0-250)	1291
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	3.30 (1.42-12.0)	7.10 (2.59-31.0)	1349

‡Not measured in Survey years 2009-2010.

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, and 07-08 are 0.232, 2.0, 1.4, and 1.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/MTBE_BiomonitoringSummary.html

Blood Methyl-tert-butyl ether (MTBE) (2011 – 2016)

CAS Number 1634-04-4

Geometric mean and selected percentiles of concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	1.62 (<LOD-2.11)	3.50 (2.98-4.12)	4.63 (4.05-5.63)	2509
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3027
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2858
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	3.21 (2.53-3.49)	3.83 (3.38-4.43)	455
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	555
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	502
Age 20+ years (2011 - 2012)	*	< LOD	1.70 (<LOD-2.14)	3.60 (3.07-4.15)	4.77 (4.12-5.96)	2054
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2472
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2356
Males (2011 - 2012)	*	< LOD	1.77 (<LOD-2.18)	3.62 (3.15-4.28)	4.85 (4.15-5.96)	1286
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1458
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1407
Females (2011 - 2012)	*	< LOD	1.49 (<LOD-2.11)	3.29 (2.53-4.12)	4.49 (3.72-5.55)	1223
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1569
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-12.0)	1451
Mexican Americans (2011 - 2012)	*	< LOD	1.94 (<LOD-2.50)	3.66 (2.70-4.33)	4.66 (3.05-17.6)	271
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	494
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-18.0)	499
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	2.42 (1.90-2.96)	3.55 (2.89-4.31)	639
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	571
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-13.0)	574
Non-Hispanic whites (2011 - 2012)	*	< LOD	1.77 (<LOD-2.37)	3.71 (3.15-4.41)	4.80 (4.10-5.96)	891
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1208
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	941
All Hispanics (2011 - 2012)	*	< LOD	1.80 (<LOD-2.23)	3.24 (2.51-4.01)	4.21 (3.25-6.09)	548
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	792
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	10.0 (<LOD-14.0)	885
Asians (2011 - 2012)	*	< LOD	< LOD	2.33 (1.41-3.89)	3.89 (2.01-6.85)	356
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	353
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	339

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 1.40, 10.0, and 10.0 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/MTBE_BiomonitoringSummary.html

Blood Methylcyclopentane (2013 – 2016)

CAS Number 96-37-7

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3143
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2899
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	583
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	512
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2560
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2387
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1524
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1436
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1619
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1463
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	483
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	512
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	603
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	624
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1295
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	924
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	781
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	886
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	355
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	342

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.020 and 0.020 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Nitrobenzene (2003 – 2010)

CAS Number 98-95-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1066
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3144
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2764
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3200
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	926
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	437
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	539
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1066
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1549
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1499
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1762
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	669
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	828
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	899
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	529
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1491
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1362
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1579
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	537
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1653
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1402
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1621
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	206
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	773
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	525
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	624
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	205
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	816
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	568
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	579
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	564
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1322
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1248
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1461

Limit of detection (LOD, see Data Analysis section) for Survey years 03-04, 05-06, 07-08, and 09-10 are 0.3, 0.3, 0.32, and 0.32 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Nitrobenzene_BiomonitoringSummary.html

Blood Nitrobenzene (2011 – 2016)

CAS Number 98-95-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2710
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3180
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3037
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	500
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	593
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	537
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2210
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2587
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2500
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1362
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1531
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1503
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1348
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1649
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1534
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	292
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	505
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	542
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	715
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	634
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	934
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1283
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	986
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	580
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	810
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	947
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	403
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	363
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	345

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.320, 0.320, and 0.320 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Nitrobenzene_BiomonitoringSummary.html

Nitromethane (2007 – 2010)

CAS Number 75-52-5

Geometric mean and selected percentiles of whole blood concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2007 - 2008)	685 (643-729)	668 (618-714)	864 (790-926)	1080 (1020-1160)	1320 (1200-1420)	2766
Total population (2009 - 2010)	673 (652-694)	657 (635-676)	836 (815-864)	1080 (1020-1140)	1310 (1270-1370)	2950
Age 12-19 years (2007 - 2008)	590 (554-629)	590 (552-628)	717 (676-798)	883 (819-986)	998 (919-1080)	451
Age 12-19 years (2009 - 2010)	591 (558-626)	551 (525-600)	719 (673-778)	903 (852-991)	1120 (939-1300)	499
Age 20-59 years (2007 - 2008)	688 (650-728)	675 (628-719)	866 (798-921)	1050 (1000-1120)	1260 (1120-1360)	1495
Age 20-59 years (2009 - 2010)	669 (645-694)	657 (633-680)	832 (806-852)	1050 (997-1110)	1270 (1180-1320)	1609
Age 60+ years (2007 - 2008)	739 (670-816)	692 (600-816)	960 (840-1110)	1340 (1210-1490)	1600 (1390-1950)	820
Age 60+ years (2009 - 2010)	733 (697-771)	721 (674-765)	920 (864-973)	1300 (1180-1390)	1560 (1400-1810)	842
Males (2007 - 2008)	679 (639-722)	664 (620-712)	853 (785-912)	1050 (993-1130)	1260 (1130-1420)	1384
Males (2009 - 2010)	666 (644-688)	651 (629-672)	837 (800-872)	1050 (995-1160)	1300 (1220-1330)	1473
Females (2007 - 2008)	690 (645-738)	670 (612-721)	871 (786-948)	1100 (1040-1200)	1370 (1260-1480)	1382
Females (2009 - 2010)	680 (657-703)	664 (639-681)	836 (813-882)	1090 (1030-1180)	1330 (1270-1420)	1477
Mexican Americans (2007 - 2008)	689 (632-752)	667 (606-736)	845 (759-961)	1080 (982-1160)	1260 (1120-1560)	535
Mexican Americans (2009 - 2010)	675 (609-748)	647 (602-717)	834 (764-939)	1120 (998-1320)	1420 (1210-1680)	607
Non-Hispanic blacks (2007 - 2008)	754 (714-796)	720 (673-792)	929 (870-1010)	1220 (1120-1320)	1500 (1340-1640)	545
Non-Hispanic blacks (2009 - 2010)	728 (683-777)	708 (648-759)	920 (844-991)	1280 (1130-1410)	1720 (1390-1960)	509
Non-Hispanic whites (2007 - 2008)	666 (619-716)	648 (597-704)	834 (756-919)	1040 (993-1150)	1270 (1160-1420)	1289
Non-Hispanic whites (2009 - 2010)	655 (636-674)	640 (623-661)	823 (795-838)	1020 (975-1070)	1270 (1180-1300)	1358

Limit of detection (LOD, see Data Analysis section) for Survey year 07-08 and 09-10 are 65.0 and 65.0, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Blood Nitromethane (2011 – 2012)‡

CAS Number 75-52-5

Geometric mean and selected percentiles of concentrations (in pg/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	680 (646-716)	653 (626-694)	847 (799-892)	1110 (1030-1240)	1400 (1290-1500)	2284
Age 12-19 years (2011 - 2012)	574 (534-617)	567 (532-624)	714 (646-753)	851 (783-969)	974 (858-1080)	423
Age 20+ years (2011 - 2012)	697 (663-732)	670 (637-708)	868 (816-914)	1170 (1060-1300)	1430 (1300-1530)	1861
Males (2011 - 2012)	668 (634-704)	641 (610-681)	821 (785-867)	1090 (1000-1200)	1340 (1190-1500)	1137
Females (2011 - 2012)	691 (653-732)	663 (630-721)	866 (806-921)	1140 (1050-1310)	1430 (1310-1550)	1147
Mexican Americans (2011 - 2012)	722 (649-805)	728 (626-794)	891 (807-1030)	1220 (932-1460)	1460 (1150-1660)	233
Non-Hispanic blacks (2011 - 2012)	751 (691-815)	716 (654-790)	933 (867-1050)	1360 (1200-1550)	1730 (1550-1850)	629
Non-Hispanic whites (2011 - 2012)	655 (623-690)	635 (610-663)	799 (760-852)	1060 (967-1180)	1320 (1170-1450)	806
All Hispanics (2011 - 2012)	692 (619-773)	694 (608-779)	851 (788-940)	1110 (942-1320)	1330 (1150-1570)	483
Asians (2011 - 2012)	825 (773-881)	813 (768-847)	1020 (941-1100)	1330 (1140-1510)	1530 (1400-1800)	303

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 is 65.0.

‡Not measured after Survey years 2011-2012.

Blood Octane (2013 – 2016)

CAS Number 111-65-9

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3125
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3000
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	584
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	539
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2541
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2461
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1510
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1478
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1615
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1522
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	478
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	544
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	609
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	615
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1283
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	968
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	775
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	950
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	349
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	342

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.100 and 0.100 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Styrene (2001 – 2010)

CAS Number 100-42-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	*	< LOD	.080 (.050-.100)	.130 (.090-.200)	.200 (.140-.260)	950
Total population (2003 - 2004)	*	< LOD	.050 (.044-.061)	.089 (.081-.097)	.120 (.110-.130)	1245
Total population (2005 - 2006)	*	< LOD	.047 (.042-.056)	.099 (.086-.113)	.135 (.120-.160)	2808
Total population (2007 - 2008)	*	< LOD	.045 (.036-.056)	.096 (.083-.109)	.130 (.115-.151)	2719
Total population (2009 - 2010)	*	< LOD	.048 (.032-.080)	.096 (.071-.127)	.132 (.106-.183)	1320
Age 12-19 years (2005 - 2006)	*	< LOD	.039 (.031-.049)	.058 (.050-.071)	.072 (.059-.089)	827
Age 12-19 years (2007 - 2008)	*	< LOD	.031 (<LOD-.035)	.047 (.039-.061)	.074 (.049-.085)	448
Age 12-19 years (2009 - 2010)	*	< LOD	.037 (<LOD-.091)	.063 (.031-.149)	.081 (.047-.149)	237
Age 20-59 years (2001 - 2002)	*	< LOD	.080 (.050-.100)	.130 (.090-.200)	.200 (.140-.260)	950
Age 20-59 years (2003 - 2004)	*	< LOD	.050 (.044-.061)	.089 (.081-.097)	.120 (.110-.130)	1245
Age 20-59 years (2005 - 2006)	*	< LOD	.051 (.044-.065)	.110 (.094-.120)	.150 (.120-.180)	1380
Age 20-59 years (2007 - 2008)	*	< LOD	.055 (.041-.076)	.109 (.094-.130)	.151 (.130-.172)	1459
Age 20-59 years (2009 - 2010)	*	< LOD	.052 (.035-.086)	.111 (.080-.131)	.146 (.116-.195)	723
Age 60+ years (2005 - 2006)	*	< LOD	.041 (.033-.055)	.083 (.072-.110)	.130 (.100-.150)	601
Age 60+ years (2007 - 2008)	*	< LOD	.034 (.031-.039)	.065 (.055-.079)	.094 (.080-.103)	812
Age 60+ years (2009 - 2010)	*	< LOD	.043 (<LOD-.071)	.071 (.043-.168)	.103 (.071-.210)	360
Males (2001 - 2002)	*	< LOD	.080 (.050-.110)	.140 (.100-.230)	.220 (.140-.340)	445
Males (2003 - 2004)	*	< LOD	.056 (.045-.068)	.089 (.081-.100)	.120 (.095-.150)	608
Males (2005 - 2006)	*	< LOD	.052 (.043-.067)	.110 (.096-.120)	.142 (.120-.170)	1326
Males (2007 - 2008)	*	< LOD	.051 (.041-.069)	.102 (.086-.123)	.144 (.117-.169)	1344
Males (2009 - 2010)	*	.031 (<LOD-.042)	.053 (.038-.086)	.116 (.092-.127)	.152 (.127-.195)	651
Females (2001 - 2002)	*	< LOD	.070 (.050-.100)	.120 (.090-.180)	.180 (.120-.260)	505
Females (2003 - 2004)	*	< LOD	.048 (.040-.060)	.090 (.074-.100)	.110 (.097-.140)	637
Females (2005 - 2006)	*	< LOD	.045 (.038-.052)	.087 (.077-.100)	.129 (.107-.150)	1482
Females (2007 - 2008)	*	< LOD	.038 (.031-.051)	.087 (.071-.102)	.127 (.104-.149)	1375
Females (2009 - 2010)	*	< LOD	.043 (<LOD-.071)	.074 (.052-.106)	.110 (.071-.176)	669

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.03, 0.03, 0.03, 0.03, and 0.03, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Blood Styrene (2001 – 2010)

CAS Number 100-42-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	*	< LOD	.050 (.030-.070)	.090 (.070-.110)	.120 (.090-.170)	225
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.049 (.033-.066)	.062 (.048-.100)	241
Mexican Americans (2005 - 2006)	*	< LOD	.035 (<LOD-.047)	.060 (.042-.092)	.092 (.064-.110)	603
Mexican Americans (2007 - 2008)	*	< LOD	.030 (<LOD-.035)	.049 (.042-.060)	.067 (.055-.084)	510
Mexican Americans (2009 - 2010)	*	< LOD	.042 (.033-.051)	.067 (.057-.079)	.083 (.069-.122)	379
Non-Hispanic blacks (2001 - 2002)	*	.040 (<LOD-.080)	.100 (.040-.180)	.180 (.110-.350)	.300 (.170-1.00)	192
Non-Hispanic blacks (2003 - 2004)	*	< LOD	.060 (.047-.077)	.100 (.077-.130)	.130 (.110-.160)	264
Non-Hispanic blacks (2005 - 2006)	*	< LOD	.056 (.047-.064)	.100 (.079-.120)	.145 (.115-.180)	781
Non-Hispanic blacks (2007 - 2008)	*	< LOD	.047 (.040-.055)	.098 (.077-.112)	.137 (.110-.192)	554
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.051 (.031-.100)	.113 (.042-.318)	.168 (.054-.493)	204
Non-Hispanic whites (2001 - 2002)	*	.030 (<LOD-.050)	.080 (.050-.110)	.130 (.090-.210)	.200 (.130-.260)	462
Non-Hispanic whites (2003 - 2004)	*	< LOD	.056 (.046-.067)	.096 (.083-.110)	.130 (.110-.140)	646
Non-Hispanic whites (2005 - 2006)	*	< LOD	.049 (.043-.058)	.103 (.087-.120)	.140 (.120-.174)	1217
Non-Hispanic whites (2007 - 2008)	*	< LOD	.049 (.037-.069)	.104 (.090-.118)	.143 (.127-.158)	1218
Non-Hispanic whites (2009 - 2010)	*	.030 (<LOD-.049)	.053 (.034-.097)	.108 (.080-.132)	.150 (.116-.205)	507

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.03, 0.03, 0.03, 0.03, and 0.03, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Blood Tetrachloroethene (Perchloroethylene) (2001 – 2010)

CAS Number 127-18-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	*	< LOD	.050 (<LOD-.060)	.100 (.070-.150)	.190 (.130-.260)	978
Total population (2003 - 2004)	*	< LOD	< LOD	.076 (.060-.097)	.140 (.091-.300)	1317
Total population (2005 - 2006)	*	< LOD	< LOD	.070 (.056-.088)	.126 (.098-.170)	2940
Total population (2007 - 2008)	*	< LOD	< LOD	.056 (.049-.061)	.094 (.075-.125)	2735
Total population (2009 - 2010)	*	< LOD	< LOD	.062 (.051-.076)	.099 (.081-.118)	3302
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	.049 (<LOD-.062)	.079 (.057-.106)	865
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	.066 (<LOD-.082)	446
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	.055 (<LOD-.061)	570
Age 20-59 years (2001 - 2002)	*	< LOD	.050 (<LOD-.060)	.100 (.070-.150)	.190 (.130-.260)	978
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	.076 (.060-.097)	.140 (.091-.300)	1317
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	.074 (.056-.100)	.130 (.098-.199)	1458
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	.056 (.050-.066)	.102 (.076-.158)	1482
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	.066 (.055-.078)	.104 (.080-.127)	1811
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	.071 (.054-.092)	.113 (.092-.190)	617
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	.057 (<LOD-.070)	.095 (.065-.151)	806
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	.071 (<LOD-.093)	.116 (.082-.175)	921
Males (2001 - 2002)	*	< LOD	.050 (<LOD-.060)	.110 (.070-.170)	.210 (.170-.340)	457
Males (2003 - 2004)	*	< LOD	< LOD	.082 (.060-.140)	.230 (.097-.410)	639
Males (2005 - 2006)	*	< LOD	< LOD	.085 (.062-.126)	.172 (.113-.300)	1404
Males (2007 - 2008)	*	< LOD	< LOD	.059 (.053-.071)	.136 (.095-.191)	1351
Males (2009 - 2010)	*	< LOD	< LOD	.068 (.055-.088)	.113 (.089-.164)	1629
Females (2001 - 2002)	*	< LOD	.050 (<LOD-.060)	.100 (.070-.140)	.150 (.100-.220)	521
Females (2003 - 2004)	*	< LOD	< LOD	.069 (.050-.091)	.120 (.085-.180)	678
Females (2005 - 2006)	*	< LOD	< LOD	.056 (.049-.071)	.090 (.070-.130)	1536
Females (2007 - 2008)	*	< LOD	< LOD	.050 (<LOD-.059)	.073 (.061-.112)	1384
Females (2009 - 2010)	*	< LOD	< LOD	.055 (<LOD-.072)	.085 (.072-.104)	1673

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.048, 0.048, 0.048, 0.048, and 0.048, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Tetrachloroethene (Perchloroethylene) (2001 – 2010)

CAS Number 127-18-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	.060 (<LOD-.070)	.070 (.060-.230)	226
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	.049 (<LOD-.097)	.100 (.054-.180)	248
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	.069 (.056-.074)	.130 (.073-.284)	713
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	.061 (<LOD-.081)	.112 (.072-.190)	544
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	.051 (<LOD-.063)	.089 (.056-.142)	669
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	.070 (.050-.110)	.110 (.060-.190)	195
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	.086 (.050-.220)	.220 (.082-.360)	284
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	.074 (.057-.112)	.120 (.069-.280)	776
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	.060 (<LOD-.095)	.106 (.074-.149)	549
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	.058 (<LOD-.078)	.100 (.061-.128)	590
Non-Hispanic whites (2001 - 2002)	*	< LOD	.050 (<LOD-.070)	.110 (.090-.170)	.210 (.150-.260)	487
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	.072 (.060-.091)	.140 (.085-.330)	686
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	.070 (.053-.090)	.130 (.092-.180)	1229
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	.053 (<LOD-.059)	.080 (.069-.112)	1219
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	.063 (.051-.077)	.103 (.077-.130)	1473

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.048, 0.048, 0.048, 0.048, and 0.048, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Tetrachloroethene (Perchloroethylene) (2011 – 2016)

CAS Number 127-18-4

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	.066 (.057-.091)	.125 (.097-.152)	2636
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	.083 (.064-.104)	2970
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	.075 (<LOD-.111)	3089
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	.055 (<LOD-.121)	.121 (.055-.201)	500
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	.053 (<LOD-.069)	556
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	546
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	.067 (.061-.089)	.125 (.098-.159)	2136
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	.086 (.066-.127)	2414
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	.084 (<LOD-.123)	2543
Males (2011 - 2012)	*	< LOD	< LOD	.083 (.055-.111)	.139 (.107-.271)	1327
Males (2013 - 2014)	*	< LOD	< LOD	.049 (<LOD-.063)	.091 (.062-.169)	1439
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	.080 (<LOD-.115)	1527
Females (2011 - 2012)	*	< LOD	< LOD	.062 (.053-.082)	.109 (.073-.139)	1309
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	.076 (.050-.103)	1531
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	.066 (<LOD-.111)	1562
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	.072 (.050-.192)	294
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	.056 (<LOD-.064)	481
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	.068 (<LOD-.115)	558
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	.067 (.054-.086)	.112 (.082-.201)	674
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	.066 (<LOD-.108)	549
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	641
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	.077 (.059-.109)	.128 (.097-.165)	935
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	.050 (<LOD-.066)	.091 (.070-.169)	1198
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	.092 (<LOD-.182)	1001
All Hispanics (2011 - 2012)	*	< LOD	< LOD	.053 (<LOD-.065)	.088 (.065-.145)	543
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	.061 (<LOD-.096)	775
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	.086 (<LOD-.117)	971
Asians (2011 - 2012)	*	< LOD	< LOD	.057 (<LOD-.103)	.100 (.057-.182)	401
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	345
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.048, 0.048, and 0.048 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Tetrachloromethane (Carbon tetrachloride) (2001 – 2010)

CAS Number 56-23-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	*	< LOD	.010 (<LOD-.010)	.010 (<LOD-.140)	.020 (.010-.050)	742
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1362
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2979
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2812
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3240
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	882
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	456
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	561
Age 20-59 years (2001 - 2002)	*	< LOD	.010 (<LOD-.010)	.010 (<LOD-.140)	.020 (.010-.050)	742
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1362
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1476
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1526
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1767
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	621
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	830
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	912
Males (2001 - 2002)	*	< LOD	.010 (<LOD-.010)	.010 (<LOD-.140)	.010 (.010-.040)	364
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	667
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1419
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1388
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1599
Females (2001 - 2002)	*	< LOD	.010 (<LOD-.010)	.010 (<LOD-.090)	.040 (.010-.080)	378
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	695
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1560
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1424
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1641

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.01, 0.005, 0.005, 0.005, and 0.005, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood Tetrachloromethane (Carbon tetrachloride) (2001 – 2010)

CAS Number 56-23-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	.010 (<LOD-.750)	.020 (.010-.050)	193
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	266
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	740
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	555
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	651
Non-Hispanic blacks (2001 - 2002)	*	< LOD	.010 (<LOD-.010)	.010 (<LOD-.020)	.010 (<LOD-.020)	132
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	299
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	779
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	562
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	576
Non-Hispanic whites (2001 - 2002)	*	< LOD	.010 (<LOD-.010)	.010 (<LOD-.140)	.030 (.010-.080)	366
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	692
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1237
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1249
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1460

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.01, 0.005, 0.005, 0.005, and 0.005, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood Tetrachloromethane (Carbon tetrachloride) (2011 – 2016)

CAS Number 56-23-5

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2720
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3199
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3067
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	511
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	598
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	544
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2209
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2601
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2523
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1357
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1543
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1514
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1363
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1656
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1553
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	295
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	505
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	558
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	738
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	614
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	628
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	916
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1304
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	993
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	580
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	808
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	971
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	405
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	364
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 5.00E-03, 5.00E-03, and 5.00E-03 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/OtherHalogenatedSolvents_BiomonitoringSummary.html

Blood Tetrahydrofuran (2013 – 2016)

CAS Number 109-99-9

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3077
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2979
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	579
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	523
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2498
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2456
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1489
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1466
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1588
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1513
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	482
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	536
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	592
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	633
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1260
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	962
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	772
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	941
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	347
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	327

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.125 and 0.125 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Toluene (2001 – 2010)

CAS Number 108-88-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	.156 (.122-.198)	.160 (.120-.220)	.340 (.260-.430)	.670 (.480-.950)	1.06 (.700-1.43)	954
Total population (2003 - 2004)	.114 (.100-.129)	.096 (.087-.110)	.220 (.180-.260)	.430 (.380-.550)	.680 (.560-.880)	1336
Total population (2005 - 2006)	.137 (.123-.152)	.120 (.110-.130)	.230 (.200-.262)	.550 (.481-.640)	.814 (.702-.937)	3050
Total population (2007 - 2008)	.103 (.090-.119)	.083 (.072-.098)	.192 (.148-.256)	.511 (.411-.608)	.735 (.634-.888)	2731
Total population (2009 - 2010)	.085 (.075-.095)	.065 (.059-.073)	.160 (.129-.205)	.533 (.428-.623)	.830 (.634-1.01)	2185
Age 12-19 years (2005 - 2006)	.110 (.098-.122)	.100 (.094-.120)	.170 (.150-.180)	.280 (.240-.310)	.400 (.300-.610)	907
Age 12-19 years (2007 - 2008)	.067 (.057-.080)	.061 (.053-.073)	.100 (.078-.133)	.205 (.141-.287)	.318 (.228-.388)	439
Age 12-19 years (2009 - 2010)	.052 (.042-.065)	.050 (.037-.066)	.080 (.061-.132)	.175 (.122-.250)	.259 (.178-.440)	374
Age 20-59 years (2001 - 2002)	.156 (.122-.198)	.160 (.120-.220)	.340 (.260-.430)	.670 (.480-.950)	1.06 (.700-1.43)	954
Age 20-59 years (2003 - 2004)	.114 (.100-.129)	.096 (.087-.110)	.220 (.180-.260)	.430 (.380-.550)	.680 (.560-.880)	1336
Age 20-59 years (2005 - 2006)	.147 (.133-.163)	.120 (.110-.137)	.260 (.210-.340)	.594 (.505-.720)	.900 (.730-1.10)	1505
Age 20-59 years (2007 - 2008)	.115 (.098-.135)	.090 (.076-.110)	.257 (.174-.339)	.589 (.508-.692)	.839 (.702-.976)	1483
Age 20-59 years (2009 - 2010)	.093 (.081-.106)	.069 (.064-.078)	.201 (.150-.285)	.597 (.485-.737)	.926 (.717-1.06)	1206
Age 60+ years (2005 - 2006)	.124 (.100-.154)	.114 (.097-.138)	.190 (.167-.230)	.520 (.370-.600)	.720 (.600-.814)	638
Age 60+ years (2007 - 2008)	.094 (.084-.105)	.078 (.070-.091)	.143 (.126-.173)	.370 (.277-.479)	.610 (.424-.742)	809
Age 60+ years (2009 - 2010)	.084 (.071-.100)	.067 (.054-.087)	.138 (.101-.232)	.454 (.244-.647)	.784 (.516-1.11)	605
Males (2001 - 2002)	.165 (.130-.209)	.170 (.120-.230)	.360 (.260-.520)	.780 (.580-1.06)	1.22 (.850-1.43)	450
Males (2003 - 2004)	.128 (.112-.148)	.110 (.096-.130)	.250 (.190-.310)	.500 (.380-.660)	.730 (.590-1.10)	647
Males (2005 - 2006)	.152 (.139-.166)	.130 (.120-.140)	.280 (.240-.330)	.640 (.550-.720)	.920 (.790-1.10)	1441
Males (2007 - 2008)	.118 (.103-.135)	.091 (.078-.113)	.256 (.191-.311)	.563 (.483-.663)	.816 (.689-.928)	1370
Males (2009 - 2010)	.095 (.083-.108)	.070 (.064-.083)	.205 (.148-.294)	.579 (.466-.750)	.978 (.659-1.13)	1088
Females (2001 - 2002)	.147 (.114-.190)	.150 (.110-.220)	.320 (.240-.390)	.550 (.400-.740)	.810 (.530-1.63)	504
Females (2003 - 2004)	.101 (.086-.118)	.085 (.070-.100)	.190 (.150-.230)	.410 (.340-.500)	.580 (.480-.750)	689
Females (2005 - 2006)	.124 (.107-.144)	.110 (.097-.130)	.190 (.170-.230)	.470 (.380-.550)	.690 (.550-.880)	1609
Females (2007 - 2008)	.091 (.078-.106)	.074 (.065-.087)	.151 (.119-.209)	.444 (.297-.589)	.679 (.533-.853)	1360
Females (2009 - 2010)	.076 (.066-.088)	.061 (.051-.070)	.129 (.106-.165)	.437 (.316-.593)	.726 (.555-.937)	1097
Mexican Americans (2001 - 2002)	.136 (.106-.176)	.140 (.080-.210)	.270 (.210-.340)	.550 (.400-.980)	.990 (.500-1.30)	219
Mexican Americans (2003 - 2004)	.084 (.074-.096)	.076 (.064-.091)	.120 (.100-.170)	.280 (.170-.410)	.400 (.310-.620)	253
Mexican Americans (2005 - 2006)	.110 (.097-.125)	.110 (.096-.120)	.160 (.140-.170)	.240 (.220-.290)	.340 (.290-.460)	737
Mexican Americans (2007 - 2008)	.079 (.068-.093)	.075 (.059-.094)	.117 (.106-.142)	.220 (.169-.292)	.339 (.253-.409)	539
Mexican Americans (2009 - 2010)	.062 (.052-.073)	.050 (.042-.061)	.100 (.083-.131)	.230 (.181-.323)	.467 (.275-.694)	494
Non-Hispanic blacks (2001 - 2002)	.137 (.089-.210)	.150 (.070-.200)	.310 (.200-.460)	.690 (.390-1.19)	1.15 (.660-1.69)	194
Non-Hispanic blacks (2003 - 2004)	.105 (.077-.144)	.095 (.070-.130)	.200 (.130-.330)	.440 (.290-.620)	.620 (.480-.710)	297
Non-Hispanic blacks (2005 - 2006)	.139 (.120-.161)	.120 (.099-.140)	.230 (.190-.290)	.450 (.370-.550)	.670 (.550-.830)	796
Non-Hispanic blacks (2007 - 2008)	.108 (.097-.120)	.083 (.076-.097)	.220 (.179-.265)	.463 (.380-.554)	.663 (.486-.899)	567
Non-Hispanic blacks (2009 - 2010)	.091 (.067-.124)	.066 (.047-.112)	.151 (.110-.251)	.493 (.340-.800)	.896 (.522-1.46)	410
Non-Hispanic whites (2001 - 2002)	.165 (.125-.217)	.170 (.120-.240)	.350 (.270-.450)	.710 (.450-1.12)	1.14 (.710-1.63)	467
Non-Hispanic whites (2003 - 2004)	.123 (.110-.139)	.100 (.092-.120)	.240 (.210-.280)	.500 (.400-.590)	.750 (.590-.940)	685
Non-Hispanic whites (2005 - 2006)	.144 (.125-.166)	.130 (.110-.140)	.260 (.210-.330)	.600 (.510-.710)	.880 (.760-.990)	1291
Non-Hispanic whites (2007 - 2008)	.110 (.094-.128)	.086 (.073-.102)	.223 (.162-.310)	.582 (.479-.693)	.832 (.706-.974)	1200
Non-Hispanic whites (2009 - 2010)	.093 (.080-.109)	.070 (.064-.085)	.199 (.143-.275)	.597 (.464-.755)	.927 (.657-1.11)	1006

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.025, 0.025, 0.025, 0.025, and 0.025, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Toluene_BiomonitoringSummary.html

Blood Toluene (2013 – 2016)‡

CAS Number 108-88-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	.087 (.080-.094)	.066 (.061-.072)	.132 (.117-.149)	.440 (.390-.501)	.707 (.625-.813)	3103
Total population (2015 - 2016)	.092 (.082-.103)	.073 (.062-.083)	.147 (.125-.174)	.441 (.367-.524)	.738 (.648-.825)	3078
Age 12-19 years (2013 - 2014)	.064 (.056-.073)	.056 (.050-.062)	.087 (.071-.106)	.164 (.125-.261)	.395 (.164-.874)	587
Age 12-19 years (2015 - 2016)	.065 (.059-.072)	.060 (.052-.070)	.094 (.084-.102)	.162 (.129-.206)	.255 (.174-.310)	545
Age 20+ years (2013 - 2014)	.091 (.084-.099)	.069 (.062-.075)	.144 (.128-.172)	.480 (.430-.531)	.726 (.653-.833)	2516
Age 20+ years (2015 - 2016)	.096 (.085-.109)	.075 (.064-.087)	.161 (.134-.200)	.489 (.383-.596)	.794 (.680-.877)	2533
Males (2013 - 2014)	.094 (.085-.104)	.070 (.064-.077)	.146 (.128-.177)	.489 (.378-.593)	.801 (.650-.929)	1499
Males (2015 - 2016)	.102 (.090-.115)	.081 (.066-.090)	.179 (.144-.219)	.490 (.391-.620)	.838 (.665-.964)	1523
Females (2013 - 2014)	.081 (.073-.089)	.062 (.056-.070)	.115 (.099-.147)	.421 (.360-.481)	.634 (.574-.704)	1604
Females (2015 - 2016)	.083 (.073-.094)	.066 (.058-.076)	.124 (.106-.147)	.374 (.321-.443)	.662 (.537-.753)	1555
Mexican Americans (2013 - 2014)	.067 (.059-.077)	.057 (.051-.066)	.091 (.076-.120)	.214 (.163-.283)	.349 (.241-.603)	501
Mexican Americans (2015 - 2016)	.083 (.077-.091)	.068 (.063-.073)	.117 (.098-.142)	.272 (.207-.414)	.497 (.319-.670)	557
Non-Hispanic blacks (2013 - 2014)	.101 (.086-.118)	.075 (.059-.098)	.227 (.170-.289)	.506 (.450-.576)	.717 (.620-.880)	602
Non-Hispanic blacks (2015 - 2016)	.099 (.084-.117)	.076 (.059-.103)	.212 (.175-.264)	.544 (.413-.675)	.767 (.654-.983)	637
Non-Hispanic whites (2013 - 2014)	.091 (.083-.100)	.068 (.062-.074)	.146 (.122-.180)	.502 (.393-.600)	.826 (.685-.913)	1250
Non-Hispanic whites (2015 - 2016)	.096 (.083-.111)	.077 (.063-.089)	.153 (.125-.197)	.508 (.374-.632)	.823 (.678-.889)	996
All Hispanics (2013 - 2014)	.072 (.063-.081)	.059 (.054-.067)	.098 (.084-.118)	.240 (.167-.317)	.451 (.326-.585)	796
All Hispanics (2015 - 2016)	.083 (.075-.091)	.067 (.060-.075)	.124 (.103-.148)	.292 (.225-.378)	.500 (.362-.675)	970
Asians (2013 - 2014)	.063 (.056-.072)	.058 (.050-.065)	.082 (.072-.104)	.147 (.122-.267)	.324 (.191-.434)	355
Asians (2015 - 2016)	.066 (.059-.074)	.058 (.053-.068)	.088 (.077-.108)	.155 (.112-.249)	.299 (.146-.522)	349

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.025 and 0.025 respectively.

‡Not measured in Survey years 2011-2012 because of elevated background levels at the blood collection site.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Toluene_BiomonitoringSummary.html

Blood Trichloroethene (Trichloroethylene) (2001 – 2010)

CAS Number 79-01-6

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	922
Total population (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1228
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3178
Total population (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	2952
Total population (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	3342
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	937
Age 12-19 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	473
Age 12-19 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	568
Age 20-59 years (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	922
Age 20-59 years (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	1228
Age 20-59 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1562
Age 20-59 years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1592
Age 20-59 years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1840
Age 60+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	679
Age 60+ years (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	887
Age 60+ years (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	934
Males (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	434
Males (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	604
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1504
Males (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1466
Males (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1647
Females (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	488
Females (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	624
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1674
Females (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1486
Females (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1695

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.012, 0.012, 0.012, 0.012, and 0.012, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Trichloroethene (Trichloroethylene) (2001 – 2010)

CAS Number 79-01-6

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	228
Mexican Americans (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	224
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	773
Mexican Americans (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	572
Mexican Americans (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	666
Non-Hispanic blacks (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	191
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	266
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	828
Non-Hispanic blacks (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	583
Non-Hispanic blacks (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	598
Non-Hispanic whites (2001 - 2002)	*	< LOD	< LOD	< LOD	< LOD	441
Non-Hispanic whites (2003 - 2004)	*	< LOD	< LOD	< LOD	< LOD	644
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1341
Non-Hispanic whites (2007 - 2008)	*	< LOD	< LOD	< LOD	< LOD	1329
Non-Hispanic whites (2009 - 2010)	*	< LOD	< LOD	< LOD	< LOD	1520

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.012, 0.012, 0.012, 0.012, and 0.012, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood Trichloroethene (Trichloroethylene) (2011 – 2016)

CAS Number 79-01-6

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2694
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3103
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3089
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	496
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	581
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	546
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2198
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2522
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2543
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1343
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1492
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1527
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1351
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1611
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1562
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	284
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	495
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	558
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	724
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	600
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	641
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	927
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1256
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1001
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	572
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	795
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	971
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	389
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	344
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.012, 0.012, and 0.012 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Blood aaa-Trifluorotoluene (2013 – 2016)

CAS Number 98-08-8

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3204
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3077
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	599
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	545
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2605
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2532
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1546
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1521
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1658
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1556
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	505
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	553
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	638
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1305
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1000
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	810
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	964
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	364
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	348

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.040 and 0.040 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood Vinyl Bromide (2013 – 2016)

CAS Number 593-60-2

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	3152
Total population (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	3063
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	586
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	539
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2566
Age 20+ years (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	2524
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1523
Males (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1514
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1629
Females (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	1549
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	501
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	551
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	601
Non-Hispanic blacks (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	638
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1277
Non-Hispanic whites (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	988
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	803
All Hispanics (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	962
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	363
Asians (2015 - 2016)	*	< LOD	< LOD	< LOD	< LOD	349

Limit of detection (LOD, see Data Analysis section) for Survey year 13-14 and 15-16 are 0.045 and 0.045 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Blood m-/p-Xylene (2001 – 2010)

CAS Number 108-38-3/106-42-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	.156 (.124-.198)	.150 (.110-.200)	.280 (.190-.430)	.500 (.370-.690)	.670 (.500-.890)	962
Total population (2003 - 2004)	.136 (.123-.150)	.130 (.120-.150)	.200 (.190-.210)	.280 (.260-.300)	.340 (.310-.400)	1346
Total population (2005 - 2006)	.132 (.122-.143)	.120 (.110-.130)	.190 (.170-.210)	.301 (.270-.330)	.410 (.360-.450)	3133
Total population (2007 - 2008)	.079 (.069-.090)	.072 (.061-.086)	.130 (.108-.156)	.231 (.200-.281)	.343 (.281-.410)	2823
Total population (2009 - 2010)	.087 (.072-.104)	.072 (.060-.088)	.151 (.123-.185)	.307 (.246-.376)	.466 (.359-.693)	3138
Age 12-19 years (2005 - 2006)	.118 (.106-.130)	.120 (.110-.120)	.160 (.150-.170)	.220 (.190-.270)	.330 (.240-.380)	923
Age 12-19 years (2007 - 2008)	.067 (.059-.076)	.061 (.052-.074)	.099 (.080-.125)	.181 (.138-.205)	.216 (.182-.282)	447
Age 12-19 years (2009 - 2010)	.066 (.054-.080)	.061 (.047-.073)	.097 (.080-.122)	.169 (.143-.218)	.261 (.202-.324)	529
Age 20-59 years (2001 - 2002)	.156 (.124-.198)	.150 (.110-.200)	.280 (.190-.430)	.500 (.370-.690)	.670 (.500-.890)	962
Age 20-59 years (2003 - 2004)	.136 (.123-.150)	.130 (.120-.150)	.200 (.190-.210)	.280 (.260-.300)	.340 (.310-.400)	1346
Age 20-59 years (2005 - 2006)	.137 (.127-.147)	.130 (.120-.140)	.200 (.180-.220)	.320 (.280-.350)	.430 (.360-.480)	1542
Age 20-59 years (2007 - 2008)	.083 (.072-.097)	.076 (.065-.089)	.143 (.116-.173)	.256 (.210-.308)	.379 (.290-.468)	1520
Age 20-59 years (2009 - 2010)	.093 (.076-.114)	.077 (.062-.098)	.171 (.130-.215)	.343 (.264-.431)	.525 (.395-1.02)	1732
Age 60+ years (2005 - 2006)	.126 (.112-.142)	.120 (.100-.130)	.184 (.150-.220)	.303 (.240-.360)	.400 (.335-.463)	668
Age 60+ years (2007 - 2008)	.073 (.063-.085)	.068 (.055-.082)	.113 (.097-.134)	.209 (.179-.243)	.308 (.255-.361)	854
Age 60+ years (2009 - 2010)	.081 (.068-.097)	.069 (.058-.084)	.139 (.107-.170)	.260 (.207-.347)	.399 (.307-.580)	877
Males (2001 - 2002)	.155 (.121-.200)	.140 (.110-.190)	.280 (.180-.440)	.510 (.350-.700)	.700 (.500-.890)	455
Males (2003 - 2004)	.149 (.134-.166)	.140 (.130-.170)	.220 (.200-.230)	.290 (.270-.320)	.380 (.300-.490)	654
Males (2005 - 2006)	.145 (.135-.157)	.130 (.130-.147)	.220 (.190-.240)	.340 (.310-.370)	.460 (.430-.490)	1480
Males (2007 - 2008)	.088 (.077-.101)	.080 (.068-.095)	.153 (.128-.178)	.260 (.224-.308)	.392 (.305-.470)	1395
Males (2009 - 2010)	.095 (.079-.115)	.078 (.064-.098)	.175 (.139-.219)	.334 (.273-.430)	.510 (.416-.799)	1546
Females (2001 - 2002)	.157 (.124-.199)	.150 (.110-.220)	.270 (.190-.410)	.480 (.360-.650)	.650 (.460-.890)	507
Females (2003 - 2004)	.124 (.112-.138)	.130 (.110-.140)	.180 (.160-.200)	.270 (.240-.300)	.340 (.290-.390)	692
Females (2005 - 2006)	.120 (.109-.132)	.110 (.100-.123)	.170 (.151-.197)	.260 (.220-.320)	.340 (.300-.420)	1653
Females (2007 - 2008)	.071 (.061-.083)	.066 (.054-.080)	.110 (.091-.142)	.201 (.169-.253)	.296 (.240-.362)	1426
Females (2009 - 2010)	.079 (.065-.096)	.067 (.057-.082)	.133 (.106-.162)	.254 (.205-.347)	.414 (.329-.613)	1592
Mexican Americans (2001 - 2002)	.134 (.097-.184)	.130 (.090-.180)	.240 (.150-.370)	.400 (.290-.540)	.540 (.380-1.10)	223
Mexican Americans (2003 - 2004)	.132 (.109-.160)	.120 (.110-.150)	.180 (.140-.230)	.250 (.220-.320)	.360 (.260-.490)	257
Mexican Americans (2005 - 2006)	.108 (.093-.125)	.110 (.098-.120)	.150 (.130-.170)	.220 (.170-.290)	.270 (.220-.370)	755
Mexican Americans (2007 - 2008)	.075 (.066-.084)	.071 (.061-.085)	.104 (.094-.120)	.181 (.134-.240)	.260 (.210-.410)	548
Mexican Americans (2009 - 2010)	.075 (.055-.102)	.067 (.049-.092)	.116 (.082-.175)	.206 (.147-.319)	.315 (.214-.829)	645
Non-Hispanic blacks (2001 - 2002)	.147 (.107-.202)	.140 (.090-.220)	.280 (.160-.460)	.470 (.330-.850)	.590 (.420-1.08)	198
Non-Hispanic blacks (2003 - 2004)	.117 (.094-.146)	.120 (.099-.140)	.170 (.140-.220)	.270 (.210-.330)	.330 (.260-.450)	297
Non-Hispanic blacks (2005 - 2006)	.131 (.120-.144)	.120 (.110-.140)	.190 (.170-.210)	.280 (.250-.320)	.350 (.320-.392)	823
Non-Hispanic blacks (2007 - 2008)	.085 (.070-.103)	.082 (.063-.103)	.138 (.120-.160)	.233 (.180-.294)	.326 (.242-.420)	571
Non-Hispanic blacks (2009 - 2010)	.086 (.058-.127)	.069 (.050-.109)	.145 (.098-.228)	.327 (.203-.593)	.591 (.234-5.34)	538
Non-Hispanic whites (2001 - 2002)	.163 (.124-.214)	.160 (.110-.220)	.300 (.190-.480)	.520 (.370-.740)	.700 (.510-.960)	468
Non-Hispanic whites (2003 - 2004)	.141 (.128-.155)	.140 (.130-.150)	.210 (.190-.220)	.290 (.270-.310)	.350 (.330-.400)	690
Non-Hispanic whites (2005 - 2006)	.136 (.125-.147)	.130 (.120-.140)	.200 (.180-.220)	.324 (.280-.350)	.430 (.368-.480)	1323
Non-Hispanic whites (2007 - 2008)	.080 (.069-.094)	.072 (.058-.088)	.138 (.109-.173)	.248 (.209-.300)	.371 (.290-.457)	1265
Non-Hispanic whites (2009 - 2010)	.092 (.077-.110)	.076 (.060-.096)	.167 (.138-.205)	.339 (.263-.416)	.484 (.392-.634)	1411

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.034, 0.034, 0.034, 0.034, and 0.034, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Blood m-/p-Xylene (2011 – 2016)

CAS Number 108-38-3/106-42-3

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	.071 (.063-.079)	.063 (.056-.073)	.106 (.100-.122)	.225 (.187-.264)	.326 (.278-.365)	2579
Total population (2013 - 2014)	.058 (.052-.064)	.048 (.042-.055)	.094 (.084-.111)	.205 (.188-.225)	.297 (.261-.340)	3174
Total population (2015 - 2016)	.056 (.051-.062)	.045 (.039-.053)	.095 (.082-.110)	.220 (.188-.255)	.316 (.278-.347)	3085
Age 12-19 years (2011 - 2012)	.067 (.055-.083)	.063 (.051-.082)	.098 (.082-.128)	.165 (.128-.194)	.223 (.169-.335)	486
Age 12-19 years (2013 - 2014)	*	.038 (<LOD-.046)	.068 (.053-.085)	.116 (.096-.163)	.206 (.145-.308)	596
Age 12-19 years (2015 - 2016)	.044 (.040-.047)	.038 (.035-.044)	.062 (.055-.073)	.109 (.090-.126)	.166 (.129-.185)	543
Age 20+ years (2011 - 2012)	.071 (.064-.079)	.063 (.056-.073)	.108 (.102-.124)	.238 (.197-.278)	.334 (.279-.386)	2093
Age 20+ years (2013 - 2014)	.060 (.054-.066)	.049 (.044-.057)	.101 (.088-.120)	.213 (.195-.238)	.309 (.270-.351)	2578
Age 20+ years (2015 - 2016)	.058 (.053-.065)	.046 (.040-.055)	.101 (.085-.122)	.238 (.208-.265)	.331 (.299-.353)	2542
Males (2011 - 2012)	.077 (.070-.086)	.070 (.062-.082)	.116 (.104-.144)	.249 (.191-.295)	.355 (.295-.424)	1292
Males (2013 - 2014)	.063 (.057-.069)	.052 (.046-.060)	.105 (.093-.124)	.234 (.190-.268)	.339 (.275-.454)	1532
Males (2015 - 2016)	.062 (.055-.070)	.051 (.043-.060)	.110 (.091-.130)	.246 (.208-.270)	.339 (.287-.403)	1525
Females (2011 - 2012)	.065 (.057-.075)	.058 (.050-.069)	.099 (.083-.122)	.218 (.177-.248)	.299 (.260-.350)	1287
Females (2013 - 2014)	.054 (.048-.060)	.044 (.037-.052)	.084 (.073-.105)	.188 (.164-.210)	.260 (.229-.291)	1642
Females (2015 - 2016)	.051 (.047-.056)	.041 (.036-.047)	.081 (.066-.095)	.197 (.152-.235)	.294 (.246-.332)	1560
Mexican Americans (2011 - 2012)	.066 (.058-.075)	.063 (.052-.075)	.095 (.081-.104)	.152 (.109-.191)	.250 (.136-.349)	266
Mexican Americans (2013 - 2014)	*	.040 (<LOD-.056)	.070 (.051-.100)	.139 (.105-.168)	.204 (.156-.309)	504
Mexican Americans (2015 - 2016)	.051 (.045-.058)	.043 (.038-.051)	.075 (.062-.091)	.154 (.120-.196)	.245 (.183-.316)	557
Non-Hispanic blacks (2011 - 2012)	.061 (.053-.071)	.058 (.047-.071)	.099 (.089-.116)	.184 (.153-.217)	.263 (.204-.341)	662
Non-Hispanic blacks (2013 - 2014)	.059 (.051-.067)	.048 (.038-.058)	.117 (.091-.133)	.220 (.187-.243)	.273 (.245-.367)	611
Non-Hispanic blacks (2015 - 2016)	.060 (.051-.070)	.045 (.038-.054)	.111 (.087-.151)	.256 (.185-.316)	.347 (.275-.455)	641
Non-Hispanic whites (2011 - 2012)	.076 (.067-.086)	.066 (.057-.080)	.116 (.102-.144)	.259 (.215-.297)	.350 (.297-.386)	909
Non-Hispanic whites (2013 - 2014)	.062 (.056-.069)	.050 (.045-.059)	.105 (.088-.133)	.227 (.190-.269)	.334 (.279-.455)	1287
Non-Hispanic whites (2015 - 2016)	.059 (.053-.067)	.047 (.041-.056)	.103 (.086-.126)	.238 (.208-.266)	.331 (.290-.362)	999
All Hispanics (2011 - 2012)	.061 (.056-.068)	.057 (.050-.067)	.088 (.081-.099)	.149 (.113-.184)	.212 (.151-.325)	551
All Hispanics (2013 - 2014)	*	.043 (<LOD-.054)	.071 (.057-.097)	.145 (.113-.171)	.212 (.179-.251)	806
All Hispanics (2015 - 2016)	.051 (.046-.057)	.042 (.036-.050)	.075 (.062-.097)	.168 (.133-.211)	.266 (.205-.363)	969
Asians (2011 - 2012)	.059 (.053-.065)	.056 (.049-.064)	.084 (.074-.095)	.122 (.113-.150)	.181 (.141-.204)	374
Asians (2013 - 2014)	*	.037 (<LOD-.047)	.061 (.048-.082)	.125 (.082-.159)	.179 (.134-.248)	362
Asians (2015 - 2016)	*	.035 (<LOD-.046)	.057 (.049-.066)	.097 (.080-.120)	.132 (.101-.200)	349

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.034, 0.034, and 0.034 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Blood o-Xylene (2001 – 2010)

CAS Number 95-47-6

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2001 - 2002)	*	< LOD	.070 (.050-.080)	.100 (.080-.130)	.130 (.110-.180)	981
Total population (2003 - 2004)	*	< LOD	.051 (<LOD-.057)	.072 (.066-.079)	.090 (.081-.097)	1365
Total population (2005 - 2006)	.037 (.034-.040)	.035 (.032-.039)	.053 (.047-.061)	.083 (.072-.094)	.110 (.094-.120)	3153
Total population (2007 - 2008)	*	< LOD	.039 (.033-.047)	.062 (.051-.076)	.086 (.068-.128)	2835
Total population (2009 - 2010)	*	< LOD	.043 (.035-.051)	.082 (.064-.105)	.129 (.095-.276)	2944
Age 12-19 years (2005 - 2006)	.032 (.030-.034)	.031 (.029-.034)	.044 (.040-.049)	.062 (.053-.075)	.088 (.072-.100)	929
Age 12-19 years (2007 - 2008)	*	< LOD	.033 (.026-.044)	.048 (.039-.080)	.066 (.048-.180)	457
Age 12-19 years (2009 - 2010)	*	< LOD	.030 (.025-.036)	.054 (.041-.067)	.089 (.059-.122)	523
Age 20-59 years (2001 - 2002)	*	< LOD	.070 (.050-.080)	.100 (.080-.130)	.130 (.110-.180)	981
Age 20-59 years (2003 - 2004)	*	< LOD	.051 (<LOD-.057)	.072 (.066-.079)	.090 (.081-.097)	1365
Age 20-59 years (2005 - 2006)	.038 (.034-.041)	.036 (.032-.039)	.055 (.048-.062)	.083 (.073-.094)	.110 (.093-.120)	1547
Age 20-59 years (2007 - 2008)	*	.025 (<LOD-.030)	.040 (.034-.048)	.065 (.053-.079)	.086 (.069-.140)	1524
Age 20-59 years (2009 - 2010)	*	.024 (<LOD-.030)	.046 (.037-.055)	.092 (.072-.119)	.165 (.102-.415)	1600
Age 60+ years (2005 - 2006)	.038 (.033-.044)	.036 (.032-.042)	.054 (.046-.065)	.092 (.065-.115)	.115 (.094-.150)	677
Age 60+ years (2007 - 2008)	*	< LOD	.038 (.031-.049)	.061 (.052-.078)	.091 (.068-.118)	854
Age 60+ years (2009 - 2010)	*	< LOD	.042 (.032-.050)	.074 (.055-.096)	.107 (.076-.228)	821
Males (2001 - 2002)	*	< LOD	.070 (.050-.090)	.110 (.080-.140)	.150 (.110-.180)	465
Males (2003 - 2004)	*	< LOD	.057 (.050-.060)	.074 (.068-.084)	.096 (.084-.110)	667
Males (2005 - 2006)	.040 (.036-.045)	.038 (.033-.041)	.058 (.050-.070)	.092 (.082-.100)	.120 (.100-.140)	1487
Males (2007 - 2008)	*	.026 (<LOD-.031)	.042 (.037-.048)	.069 (.059-.083)	.098 (.078-.146)	1407
Males (2009 - 2010)	*	.025 (<LOD-.029)	.047 (.040-.055)	.089 (.072-.112)	.152 (.100-.276)	1452
Females (2001 - 2002)	*	< LOD	.060 (.050-.080)	.100 (.070-.130)	.120 (.100-.180)	516
Females (2003 - 2004)	*	< LOD	< LOD	.067 (.059-.076)	.085 (.074-.095)	698
Females (2005 - 2006)	.034 (.032-.037)	.034 (.031-.036)	.049 (.044-.054)	.072 (.060-.086)	.094 (.078-.110)	1666
Females (2007 - 2008)	*	< LOD	.036 (.029-.044)	.056 (.046-.070)	.076 (.056-.120)	1428
Females (2009 - 2010)	*	< LOD	.038 (.030-.047)	.077 (.053-.103)	.118 (.083-.343)	1492

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.049, 0.049, 0.024, 0.024, and 0.024, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Blood o-Xylene (2001 – 2010)

CAS Number 95-47-6

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Mexican Americans (2001 - 2002)	*	< LOD	.060 (<LOD-.080)	.090 (.080-.110)	.120 (.090-.270)	227
Mexican Americans (2003 - 2004)	*	< LOD	.052 (<LOD-.067)	.074 (.067-.080)	.100 (.075-.130)	265
Mexican Americans (2005 - 2006)	.030 (.027-.033)	.029 (.026-.031)	.040 (.036-.045)	.057 (.050-.069)	.079 (.062-.097)	777
Mexican Americans (2007 - 2008)	*	.025 (<LOD-.028)	.032 (.030-.038)	.060 (.038-.140)	.121 (.052-.210)	561
Mexican Americans (2009 - 2010)	*	< LOD	.031 (<LOD-.045)	.054 (.037-.092)	.090 (.054-.415)	603
Non-Hispanic blacks (2001 - 2002)	*	< LOD	.050 (<LOD-.070)	.100 (.080-.110)	.110 (.100-.160)	197
Non-Hispanic blacks (2003 - 2004)	*	< LOD	< LOD	.065 (.055-.078)	.084 (.068-.100)	301
Non-Hispanic blacks (2005 - 2006)	.035 (.033-.038)	.034 (.031-.038)	.049 (.045-.054)	.073 (.064-.077)	.088 (.078-.100)	824
Non-Hispanic blacks (2007 - 2008)	*	.027 (<LOD-.035)	.041 (.032-.054)	.066 (.045-.130)	.100 (.054-.470)	573
Non-Hispanic blacks (2009 - 2010)	*	< LOD	.043 (.031-.057)	.080 (.050-.207)	.154 (.063-1.70)	548
Non-Hispanic whites (2001 - 2002)	*	< LOD	.070 (.050-.090)	.110 (.080-.140)	.140 (.110-.180)	483
Non-Hispanic whites (2003 - 2004)	*	< LOD	.052 (<LOD-.058)	.073 (.066-.082)	.090 (.081-.100)	694
Non-Hispanic whites (2005 - 2006)	.039 (.035-.043)	.037 (.033-.041)	.056 (.049-.064)	.087 (.074-.100)	.110 (.096-.130)	1319
Non-Hispanic whites (2007 - 2008)	*	< LOD	.040 (.033-.048)	.063 (.052-.079)	.086 (.069-.117)	1242
Non-Hispanic whites (2009 - 2010)	*	< LOD	.047 (.041-.054)	.091 (.075-.108)	.144 (.104-.262)	1265

Limit of detection (LOD, see Data Analysis section) for Survey years 01-02, 03-04, 05-06, 07-08, and 09-10 are 0.049, 0.049, 0.024, 0.024, and 0.024, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Blood o-Xylene (2011 – 2016)

CAS Number 95-47-6

Geometric mean and selected percentiles of whole blood concentrations (in ng/mL) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	.031 (.027-.036)	.054 (.045-.064)	.077 (.062-.091)	2718
Total population (2013 - 2014)	*	< LOD	.027 (<LOD-.031)	.049 (.043-.053)	.066 (.059-.075)	3204
Total population (2015 - 2016)	*	< LOD	.025 (<LOD-.030)	.049 (.042-.059)	.070 (.061-.079)	3065
Age 12-19 years (2011 - 2012)	*	< LOD	.027 (<LOD-.034)	.043 (.034-.048)	.051 (.043-.067)	517
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	.035 (.028-.042)	.046 (.035-.069)	599
Age 12-19 years (2015 - 2016)	*	< LOD	< LOD	.030 (.027-.036)	.045 (.034-.056)	540
Age 20+ years (2011 - 2012)	*	< LOD	.032 (.028-.038)	.056 (.046-.068)	.080 (.065-.093)	2201
Age 20+ years (2013 - 2014)	*	< LOD	.028 (<LOD-.032)	.050 (.045-.054)	.068 (.059-.081)	2605
Age 20+ years (2015 - 2016)	*	< LOD	.026 (<LOD-.031)	.052 (.044-.062)	.071 (.064-.081)	2525
Males (2011 - 2012)	*	< LOD	.034 (.029-.040)	.058 (.048-.069)	.088 (.068-.097)	1359
Males (2013 - 2014)	*	< LOD	.030 (.026-.033)	.051 (.045-.061)	.074 (.060-.088)	1546
Males (2015 - 2016)	*	< LOD	.028 (.024-.034)	.053 (.043-.063)	.072 (.060-.092)	1518
Females (2011 - 2012)	*	< LOD	.028 (.024-.034)	.051 (.040-.060)	.067 (.056-.087)	1359
Females (2013 - 2014)	*	< LOD	.025 (<LOD-.030)	.044 (.038-.050)	.059 (.050-.070)	1658
Females (2015 - 2016)	*	< LOD	< LOD	.045 (.037-.055)	.067 (.057-.074)	1547
Mexican Americans (2011 - 2012)	*	< LOD	.028 (.025-.031)	.042 (.033-.059)	.065 (.040-.265)	290
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	.038 (.028-.049)	.055 (.042-.075)	505
Mexican Americans (2015 - 2016)	*	< LOD	< LOD	.036 (.026-.052)	.062 (.051-.080)	540
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.029 (<LOD-.033)	.046 (.038-.054)	.061 (.050-.070)	721
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.028 (.025-.030)	.049 (.039-.054)	.066 (.051-.081)	615
Non-Hispanic blacks (2015 - 2016)	*	< LOD	.028 (<LOD-.034)	.053 (.044-.064)	.068 (.055-.112)	641
Non-Hispanic whites (2011 - 2012)	*	< LOD	.034 (.028-.042)	.058 (.048-.072)	.087 (.068-.097)	946
Non-Hispanic whites (2013 - 2014)	*	< LOD	.029 (.025-.033)	.051 (.044-.060)	.071 (.059-.090)	1305
Non-Hispanic whites (2015 - 2016)	*	< LOD	.027 (<LOD-.033)	.053 (.044-.064)	.073 (.063-.082)	998
All Hispanics (2011 - 2012)	*	< LOD	.026 (.024-.028)	.040 (.033-.050)	.057 (.042-.089)	571
All Hispanics (2013 - 2014)	*	< LOD	< LOD	.039 (.031-.047)	.052 (.046-.062)	810
All Hispanics (2015 - 2016)	*	< LOD	< LOD	.042 (.031-.054)	.064 (.052-.092)	952
Asians (2011 - 2012)	*	< LOD	< LOD	.033 (.029-.040)	.046 (.035-.054)	398
Asians (2013 - 2014)	*	< LOD	< LOD	.031 (<LOD-.043)	.048 (.031-.070)	364
Asians (2015 - 2016)	*	< LOD	< LOD	.028 (<LOD-.033)	.036 (.028-.050)	347

Limit of detection (LOD, see Data Analysis section) for Survey years 11-12, 13-14, and 15-16 are 0.024, 0.024, and 0.024 respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2-carboxyethyl)-L-cysteine (2005 – 2006)

CAS Number 51868-61-2

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	86.5 (80.1-93.4)	92.2 (82.7-103)	178 (164-195)	315 (291-353)	491 (442-516)	3345
Age 12-19 years (2005 - 2006)	89.8 (75.3-107)	104 (83.1-124)	170 (155-195)	272 (247-319)	368 (319-424)	1031
Age 20+ years (2005 - 2006)	86.0 (79.6-92.9)	90.4 (80.7-101)	180 (163-196)	328 (293-362)	499 (446-533)	2311
Males (2005 - 2006)	106 (98.5-113)	113 (102-125)	196 (175-221)	355 (293-437)	516 (446-579)	1589
Females (2005 - 2006)	71.5 (64.1-79.8)	74.4 (66.2-84.0)	158 (145-172)	286 (258-338)	438 (356-499)	1753
Mexican Americans (2005 - 2006)	77.0 (68.6-86.5)	83.3 (74.3-95.9)	152 (128-174)	241 (217-267)	315 (257-406)	819
Non-Hispanic blacks (2005 - 2006)	137 (125-151)	142 (126-162)	264 (227-292)	438 (387-507)	592 (474-695)	898
Non-Hispanic whites (2005 - 2006)	82.1 (74.7-90.3)	84.1 (74.5-94.0)	172 (154-192)	306 (276-351)	481 (404-529)	1369

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 6.96.

Urinary N-Acetyl-S-(2-carboxyethyl)-L-cysteine (2011 – 2014)

CAS Number 51868-61-2

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	87.1 (79.9-95.0)	90.4 (84.5-98.6)	178 (163-196)	326 (294-374)	457 (399-560)	2466
Total population (2013 - 2014)	79.0 (72.8-85.7)	81.7 (74.4-90.3)	167 (151-183)	299 (276-330)	434 (401-479)	2609
Age 6-11 years (2011 - 2012)	69.7 (61.3-79.3)	71.3 (56.2-88.9)	144 (123-165)	236 (198-304)	330 (245-489)	394
Age 6-11 years (2013 - 2014)	57.3 (50.1-65.4)	59.0 (51.8-71.9)	123 (105-135)	206 (169-257)	275 (220-308)	392
Age 12-19 years (2011 - 2012)	73.7 (58.2-93.3)	85.0 (63.5-98.6)	145 (111-187)	256 (198-296)	382 (290-437)	384
Age 12-19 years (2013 - 2014)	76.8 (66.3-88.9)	82.9 (65.4-105)	149 (126-180)	260 (208-349)	387 (282-497)	443
Age 20+ years (2011 - 2012)	91.6 (83.3-101)	94.0 (85.4-107)	187 (168-209)	347 (298-399)	488 (411-637)	1688
Age 20+ years (2013 - 2014)	82.1 (74.9-89.9)	84.5 (75.2-94.0)	177 (162-192)	327 (289-361)	458 (410-542)	1774
Males (2011 - 2012)	105 (95.8-116)	107 (96.8-114)	197 (174-231)	351 (316-414)	489 (438-576)	1251
Males (2013 - 2014)	88.0 (78.5-98.6)	94.5 (80.4-107)	174 (153-193)	303 (276-340)	422 (381-470)	1299
Females (2011 - 2012)	72.5 (64.3-81.9)	74.1 (64.0-85.4)	162 (142-178)	295 (240-356)	413 (342-608)	1215
Females (2013 - 2014)	71.1 (65.5-77.2)	70.6 (61.5-78.2)	157 (139-184)	290 (261-348)	446 (392-542)	1310
Mexican Americans (2011 - 2012)	81.5 (70.1-94.8)	79.5 (74.1-91.3)	144 (118-171)	248 (182-316)	368 (248-571)	313
Mexican Americans (2013 - 2014)	72.0 (63.9-81.2)	76.8 (69.4-83.9)	135 (118-151)	208 (172-360)	383 (238-526)	443
Non-Hispanic blacks (2011 - 2012)	129 (117-141)	136 (123-148)	238 (218-264)	373 (322-433)	539 (454-618)	662
Non-Hispanic blacks (2013 - 2014)	138 (128-149)	144 (131-157)	243 (217-275)	432 (385-473)	526 (473-743)	562
Non-Hispanic whites (2011 - 2012)	84.0 (74.4-94.7)	87.3 (78.9-98.6)	176 (151-203)	338 (285-384)	457 (398-596)	810
Non-Hispanic whites (2013 - 2014)	75.2 (67.1-84.4)	75.6 (66.4-88.8)	161 (145-184)	299 (270-336)	438 (393-542)	973
All Hispanics (2011 - 2012)	79.9 (68.6-93.1)	82.5 (69.9-98.6)	147 (118-173)	267 (209-314)	379 (299-474)	566
All Hispanics (2013 - 2014)	73.1 (66.5-80.2)	78.5 (71.7-86.0)	140 (125-155)	236 (192-290)	347 (249-450)	687
Asians (2011 - 2012)	65.8 (59.9-72.2)	69.8 (60.7-77.8)	123 (111-147)	236 (181-289)	337 (263-440)	341
Asians (2013 - 2014)	53.4 (45.6-62.5)	53.9 (47.4-66.4)	94.0 (80.7-114)	183 (133-226)	261 (188-378)	284

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 6.96 and 6.96, respectively.

Urinary N-Acetyl-S-(2-carboxyethyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 51868-61-2

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	86.7 (80.8-93.0)	83.4 (76.8-90.4)	145 (133-158)	259 (232-278)	362 (329-389)	3330
Age 12-19 years (2005 - 2006)	68.8 (61.9-76.6)	68.4 (60.7-74.2)	112 (96.9-128)	171 (144-190)	211 (185-254)	1027
Age 20+ years (2005 - 2006)	89.9 (83.3-97.1)	86.5 (77.8-94.4)	151 (137-166)	270 (238-311)	385 (352-431)	2303
Males (2005 - 2006)	86.4 (79.4-94.1)	83.3 (75.4-91.2)	140 (124-156)	238 (206-274)	357 (296-385)	1583
Females (2005 - 2006)	86.9 (79.5-95.1)	84.5 (75.6-92.5)	151 (136-167)	272 (243-304)	387 (338-437)	1747
Mexican Americans (2005 - 2006)	69.1 (63.7-75.1)	74.3 (66.8-82.3)	117 (105-128)	170 (151-188)	210 (188-227)	816
Non-Hispanic blacks (2005 - 2006)	94.6 (86.9-103)	94.9 (86.5-103)	152 (141-167)	259 (227-311)	376 (293-426)	896
Non-Hispanic whites (2005 - 2006)	88.6 (81.1-96.8)	83.3 (75.6-92.1)	150 (134-171)	267 (232-311)	373 (324-433)	1364

Urinary N-Acetyl-S-(2-carboxyethyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 51868-61-2

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	99.5 (92.7-107)	92.9 (86.7-97.5)	161 (145-173)	285 (245-329)	422 (348-494)	2464
Total population (2013 - 2014)	91.4 (84.1-99.4)	87.7 (80.2-95.6)	151 (136-166)	265 (239-294)	380 (337-425)	2608
Age 6-11 years (2011 - 2012)	99.5 (91.8-108)	98.1 (88.1-106)	159 (143-173)	227 (205-272)	311 (229-330)	393
Age 6-11 years (2013 - 2014)	86.1 (78.7-94.2)	87.0 (77.8-97.2)	134 (118-154)	208 (173-223)	236 (210-267)	392
Age 12-19 years (2011 - 2012)	71.8 (63.8-80.7)	68.5 (60.1-75.5)	104 (86.2-124)	162 (129-225)	225 (160-334)	384
Age 12-19 years (2013 - 2014)	69.6 (64.3-75.3)	69.0 (59.6-75.5)	111 (91.5-125)	169 (148-202)	241 (187-290)	443
Age 20+ years (2011 - 2012)	104 (96.7-113)	96.6 (91.0-103)	170 (157-181)	318 (262-370)	474 (373-590)	1687
Age 20+ years (2013 - 2014)	95.8 (87.4-105)	91.3 (82.7-99.4)	159 (145-174)	293 (260-320)	412 (358-462)	1773
Males (2011 - 2012)	99.0 (92.1-106)	88.4 (80.0-98.4)	158 (138-173)	284 (242-334)	402 (329-488)	1250
Males (2013 - 2014)	88.3 (79.4-98.2)	87.6 (78.2-95.2)	141 (128-153)	240 (204-259)	346 (295-372)	1298
Females (2011 - 2012)	99.9 (90.4-110)	94.5 (88.1-102)	164 (150-174)	293 (228-370)	455 (322-678)	1214
Females (2013 - 2014)	94.6 (86.7-103)	87.8 (80.2-97.8)	162 (145-184)	290 (251-325)	428 (355-474)	1310
Mexican Americans (2011 - 2012)	92.0 (79.6-106)	86.3 (76.6-98.0)	140 (118-166)	212 (169-298)	308 (204-478)	313
Mexican Americans (2013 - 2014)	82.3 (74.3-91.2)	78.0 (71.1-87.6)	122 (112-134)	215 (167-267)	309 (215-442)	443
Non-Hispanic blacks (2011 - 2012)	100 (93.8-108)	97.5 (92.2-103)	158 (140-172)	247 (212-274)	321 (263-399)	662
Non-Hispanic blacks (2013 - 2014)	106 (95.5-118)	102 (95.8-113)	169 (155-191)	288 (256-330)	381 (333-432)	562
Non-Hispanic whites (2011 - 2012)	103 (93.4-113)	94.5 (86.1-102)	170 (148-188)	321 (269-381)	488 (390-579)	808
Non-Hispanic whites (2013 - 2014)	92.7 (83.9-102)	87.2 (77.6-96.4)	155 (143-173)	289 (241-333)	412 (351-467)	972
All Hispanics (2011 - 2012)	89.4 (80.3-99.5)	85.0 (77.2-95.0)	136 (122-153)	210 (188-247)	296 (217-366)	566
All Hispanics (2013 - 2014)	81.4 (75.4-87.9)	79.3 (72.9-85.6)	123 (111-138)	210 (172-238)	294 (217-426)	687
Asians (2011 - 2012)	88.0 (82.2-94.3)	87.5 (78.9-92.9)	131 (118-147)	207 (179-249)	301 (240-411)	341
Asians (2013 - 2014)	84.0 (73.0-96.7)	84.9 (73.8-97.6)	129 (107-155)	201 (156-289)	306 (204-382)	284

Urinary N-Acetyl-S-(3-hydroxypropyl)-L-cysteine (2005 – 2006)

CAS Number 23127-40-4

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	244 (223-266)	245 (221-271)	516 (463-582)	1160 (1020-1370)	2010 (1660-2290)	3349
Age 12-19 years (2005 - 2006)	227 (198-262)	234 (202-286)	427 (375-495)	749 (618-883)	1050 (809-1430)	1035
Age 20+ years (2005 - 2006)	246 (223-271)	247 (221-275)	538 (479-611)	1270 (1100-1440)	2230 (1850-2480)	2313
Males (2005 - 2006)	308 (285-333)	309 (275-333)	582 (508-685)	1380 (1060-1630)	2210 (1900-2320)	1592
Females (2005 - 2006)	195 (174-218)	189 (171-212)	439 (385-516)	1050 (809-1270)	1600 (1360-2360)	1756
Mexican Americans (2005 - 2006)	237 (215-262)	246 (219-276)	473 (437-535)	816 (718-905)	1110 (942-1380)	822
Non-Hispanic blacks (2005 - 2006)	323 (286-363)	312 (280-336)	654 (549-749)	1330 (1070-1830)	2080 (1700-2320)	902
Non-Hispanic whites (2005 - 2006)	234 (208-262)	230 (206-259)	509 (445-602)	1270 (1050-1480)	2250 (1820-2590)	1369

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 13.0.

Urinary N-Acetyl-S-(3-hydroxypropyl)-L-cysteine (2011 – 2014)

CAS Number 23127-40-4

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	225 (207-243)	210 (191-232)	433 (384-491)	949 (831-1120)	1550 (1330-1950)	2466
Total population (2013 - 2014)	215 (198-234)	203 (186-226)	436 (389-479)	912 (809-1070)	1430 (1250-1760)	2606
Age 6-11 years (2011 - 2012)	169 (152-188)	171 (148-205)	342 (286-391)	524 (452-607)	671 (597-816)	394
Age 6-11 years (2013 - 2014)	159 (142-178)	160 (132-196)	318 (272-369)	519 (460-677)	804 (625-883)	389
Age 12-19 years (2011 - 2012)	191 (155-237)	189 (145-256)	377 (296-467)	675 (494-868)	1100 (657-1470)	384
Age 12-19 years (2013 - 2014)	191 (165-222)	202 (168-232)	356 (289-422)	642 (556-814)	881 (718-1400)	445
Age 20+ years (2011 - 2012)	237 (219-257)	220 (201-244)	464 (419-528)	1070 (934-1220)	1810 (1520-2150)	1688
Age 20+ years (2013 - 2014)	226 (205-249)	210 (186-240)	469 (415-527)	1050 (890-1190)	1520 (1310-2010)	1772
Males (2011 - 2012)	269 (248-292)	250 (226-269)	469 (415-547)	971 (831-1300)	1610 (1400-2350)	1251
Males (2013 - 2014)	238 (213-266)	235 (196-263)	441 (386-512)	894 (786-1190)	1470 (1290-1590)	1299
Females (2011 - 2012)	189 (167-213)	165 (149-190)	395 (340-463)	897 (731-1200)	1440 (1260-1950)	1215
Females (2013 - 2014)	195 (174-218)	184 (158-203)	430 (366-501)	949 (779-1070)	1420 (1070-2080)	1307
Mexican Americans (2011 - 2012)	220 (185-262)	223 (183-283)	414 (346-475)	714 (558-831)	1030 (714-1440)	313
Mexican Americans (2013 - 2014)	203 (179-230)	197 (176-228)	378 (341-437)	654 (518-1070)	1110 (654-1420)	441
Non-Hispanic blacks (2011 - 2012)	282 (247-321)	268 (239-296)	547 (446-631)	1070 (853-1350)	1640 (1350-1980)	662
Non-Hispanic blacks (2013 - 2014)	301 (268-338)	289 (244-350)	560 (479-658)	1230 (1000-1410)	2020 (1410-2510)	571
Non-Hispanic whites (2011 - 2012)	213 (191-238)	195 (174-220)	421 (364-488)	971 (771-1220)	1710 (1320-2150)	810
Non-Hispanic whites (2013 - 2014)	202 (179-228)	185 (159-207)	421 (354-503)	957 (803-1160)	1470 (1190-2010)	963
All Hispanics (2011 - 2012)	213 (187-244)	213 (171-262)	395 (354-438)	726 (577-853)	1060 (734-1500)	566
All Hispanics (2013 - 2014)	205 (183-230)	208 (182-229)	389 (342-457)	662 (540-868)	1080 (764-1250)	684
Asians (2011 - 2012)	250 (230-271)	240 (201-298)	550 (435-640)	912 (731-1130)	1260 (1010-1900)	341
Asians (2013 - 2014)	227 (195-264)	209 (190-247)	419 (366-498)	827 (664-1100)	1300 (838-1970)	287

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 13.0 and 13.0, respectively.

Urinary N-Acetyl-S-(3-hydroxypropyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 23127-40-4

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	244 (224-266)	211 (195-222)	399 (360-483)	1070 (908-1270)	1680 (1500-1910)	3333
Age 12-19 years (2005 - 2006)	174 (159-190)	160 (146-177)	280 (244-306)	442 (376-540)	658 (500-810)	1028
Age 20+ years (2005 - 2006)	257 (233-285)	220 (202-231)	449 (378-558)	1240 (1000-1370)	1810 (1600-2140)	2303
Males (2005 - 2006)	252 (230-276)	217 (205-227)	390 (338-486)	1000 (857-1270)	1600 (1330-2080)	1583
Females (2005 - 2006)	237 (214-261)	194 (179-222)	417 (359-513)	1150 (992-1270)	1740 (1500-1960)	1748
Mexican Americans (2005 - 2006)	213 (201-225)	196 (188-212)	346 (315-370)	599 (517-651)	881 (718-909)	816
Non-Hispanic blacks (2005 - 2006)	222 (199-249)	192 (177-211)	397 (344-435)	879 (732-1020)	1290 (995-1710)	896
Non-Hispanic whites (2005 - 2006)	252 (224-283)	212 (191-224)	446 (361-565)	1280 (1010-1460)	1990 (1630-2260)	1365

Urinary N-Acetyl-S-(3-hydroxypropyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 23127-40-4

Metabolite of Acrolein

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	256 (239-275)	211 (197-226)	413 (378-446)	909 (776-1050)	1620 (1340-2040)	2464
Total population (2013 - 2014)	245 (225-268)	213 (193-235)	416 (373-468)	906 (796-1030)	1460 (1170-1790)	2605
Age 6-11 years (2011 - 2012)	241 (225-258)	233 (210-249)	360 (316-391)	530 (433-621)	763 (552-923)	393
Age 6-11 years (2013 - 2014)	232 (214-251)	214 (193-239)	321 (284-381)	599 (499-656)	706 (616-1120)	389
Age 12-19 years (2011 - 2012)	186 (162-215)	169 (142-208)	273 (228-339)	443 (351-632)	645 (443-914)	384
Age 12-19 years (2013 - 2014)	171 (152-193)	163 (132-198)	267 (238-302)	494 (393-575)	625 (503-1140)	445
Age 20+ years (2011 - 2012)	271 (253-290)	218 (200-235)	458 (421-500)	1080 (891-1310)	2010 (1620-2270)	1687
Age 20+ years (2013 - 2014)	260 (236-287)	224 (202-246)	461 (400-521)	1010 (879-1140)	1700 (1300-2190)	1771
Males (2011 - 2012)	253 (235-273)	205 (195-226)	393 (353-447)	815 (669-1030)	1380 (1110-1930)	1250
Males (2013 - 2014)	237 (215-261)	213 (190-238)	373 (323-446)	777 (636-906)	1220 (913-1540)	1298
Females (2011 - 2012)	260 (233-290)	217 (191-244)	426 (378-474)	1030 (775-1310)	1820 (1430-2250)	1214
Females (2013 - 2014)	254 (223-289)	212 (186-241)	469 (378-556)	1080 (872-1320)	1730 (1320-2590)	1307
Mexican Americans (2011 - 2012)	248 (211-293)	224 (196-265)	362 (317-438)	617 (492-727)	815 (617-1360)	313
Mexican Americans (2013 - 2014)	229 (206-254)	210 (198-230)	335 (300-370)	691 (479-921)	1010 (620-1760)	441
Non-Hispanic blacks (2011 - 2012)	220 (200-241)	185 (166-215)	331 (298-389)	698 (580-853)	1020 (826-1330)	662
Non-Hispanic blacks (2013 - 2014)	230 (205-257)	204 (178-236)	407 (320-469)	772 (660-1020)	1170 (986-1320)	571
Non-Hispanic whites (2011 - 2012)	261 (237-286)	207 (194-226)	421 (371-472)	1080 (812-1340)	1990 (1430-2290)	808
Non-Hispanic whites (2013 - 2014)	246 (220-274)	205 (184-231)	431 (372-499)	945 (848-1220)	1700 (1140-2290)	962
All Hispanics (2011 - 2012)	239 (215-265)	217 (191-239)	363 (336-411)	637 (568-727)	859 (707-1220)	566
All Hispanics (2013 - 2014)	225 (204-247)	208 (193-230)	331 (296-371)	693 (486-921)	1030 (689-1760)	684
Asians (2011 - 2012)	334 (304-367)	311 (267-353)	563 (464-628)	964 (747-1160)	1370 (1040-2450)	341
Asians (2013 - 2014)	357 (309-412)	329 (267-406)	576 (492-756)	1080 (831-1360)	1510 (1100-1910)	287

Urinary N-Acetyl-S-(2-carbamoylethyl)-L-cysteine (2005 – 2006)

CAS Number 81690-92-8

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	56.6 (52.3-61.2)	58.6 (53.9-64.7)	113 (105-123)	209 (182-247)	313 (266-343)	3343
Age 12-19 years (2005 - 2006)	68.7 (61.5-76.8)	72.0 (63.1-83.1)	126 (108-156)	211 (176-239)	295 (235-334)	1030
Age 20+ years (2005 - 2006)	54.9 (50.6-59.5)	56.8 (51.8-62.4)	110 (102-120)	208 (179-248)	313 (265-345)	2310
Males (2005 - 2006)	69.7 (64.9-74.9)	70.1 (65.3-76.0)	133 (117-148)	253 (202-305)	363 (305-413)	1587
Females (2005 - 2006)	46.3 (42.3-50.7)	48.8 (43.5-53.6)	93.0 (84.5-106)	175 (148-200)	242 (196-314)	1752
Mexican Americans (2005 - 2006)	59.8 (53.8-66.5)	69.8 (61.7-75.9)	112 (102-130)	178 (164-193)	231 (196-299)	821
Non-Hispanic blacks (2005 - 2006)	75.8 (67.1-85.6)	80.1 (68.9-91.2)	138 (119-155)	259 (206-331)	366 (292-442)	897
Non-Hispanic whites (2005 - 2006)	55.4 (50.8-60.5)	56.8 (52.1-61.6)	112 (102-121)	219 (176-260)	314 (260-345)	1368

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 2.2.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-carbamoylethyl)-L-cysteine (2011 – 2014)

CAS Number 81690-92-8

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	46.6 (43.6-49.9)	45.9 (43.1-48.9)	88.4 (82.8-95.9)	170 (155-195)	276 (211-370)	2466
Total population (2013 - 2014)	45.7 (41.3-50.7)	45.8 (42.2-49.6)	96.5 (86.6-104)	181 (153-204)	265 (229-297)	2511
Age 6-11 years (2011 - 2012)	39.6 (36.0-43.5)	44.5 (40.0-51.5)	69.8 (60.5-82.2)	111 (96.8-126)	139 (122-187)	394
Age 6-11 years (2013 - 2014)	36.0 (30.8-42.0)	35.2 (32.0-38.9)	71.3 (52.9-83.9)	133 (96.7-183)	191 (133-246)	385
Age 12-19 years (2011 - 2012)	53.5 (45.2-63.4)	49.8 (41.9-66.3)	119 (95.2-142)	168 (158-202)	279 (168-439)	384
Age 12-19 years (2013 - 2014)	51.0 (43.6-59.7)	54.4 (47.0-60.6)	102 (85.3-122)	171 (128-235)	267 (171-394)	426
Age 20+ years (2011 - 2012)	46.5 (42.6-50.7)	45.2 (42.4-49.0)	85.8 (79.9-97.4)	181 (154-208)	285 (221-384)	1688
Age 20+ years (2013 - 2014)	46.2 (41.4-51.5)	45.8 (41.8-50.6)	97.8 (87.5-107)	187 (162-210)	274 (234-317)	1700
Males (2011 - 2012)	55.6 (50.8-60.9)	53.4 (48.8-59.8)	101 (84.9-116)	177 (157-215)	276 (220-382)	1251
Males (2013 - 2014)	50.1 (44.4-56.6)	49.7 (45.5-55.0)	100 (89.7-114)	183 (158-226)	267 (236-314)	1240
Females (2011 - 2012)	39.3 (35.4-43.7)	38.7 (34.9-42.8)	75.3 (67.1-84.6)	158 (127-195)	272 (193-382)	1215
Females (2013 - 2014)	41.9 (37.4-46.8)	41.7 (35.7-46.5)	90.5 (78.6-102)	179 (144-200)	259 (203-304)	1271
Mexican Americans (2011 - 2012)	48.6 (41.6-56.9)	51.5 (42.7-59.8)	87.7 (75.1-108)	143 (108-195)	195 (143-274)	313
Mexican Americans (2013 - 2014)	49.5 (42.2-58.1)	52.4 (44.2-61.3)	94.0 (75.3-116)	153 (122-183)	199 (176-237)	425
Non-Hispanic blacks (2011 - 2012)	59.3 (54.0-65.0)	55.8 (49.9-62.2)	115 (93.8-141)	234 (178-276)	349 (293-419)	662
Non-Hispanic blacks (2013 - 2014)	71.5 (63.3-80.8)	69.0 (57.8-83.0)	141 (109-171)	267 (218-338)	439 (336-517)	551
Non-Hispanic whites (2011 - 2012)	46.4 (42.0-51.3)	45.1 (41.4-49.6)	87.6 (78.5-101)	168 (151-202)	285 (195-420)	810
Non-Hispanic whites (2013 - 2014)	43.5 (37.3-50.7)	42.8 (37.1-48.7)	94.8 (80.0-105)	180 (134-226)	266 (207-317)	923
All Hispanics (2011 - 2012)	43.4 (37.3-50.5)	45.6 (38.7-52.2)	80.0 (69.1-91.1)	143 (112-186)	192 (163-264)	566
All Hispanics (2013 - 2014)	46.4 (41.1-52.4)	48.5 (42.2-53.7)	90.3 (74.9-109)	161 (127-183)	204 (175-258)	656
Asians (2011 - 2012)	31.8 (27.6-36.6)	33.3 (29.0-39.7)	58.4 (50.1-71.9)	109 (78.3-145)	153 (131-200)	341
Asians (2013 - 2014)	29.3 (25.6-33.5)	28.2 (24.5-34.3)	51.4 (46.0-61.8)	107 (84.9-127)	158 (114-199)	280

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 2.2 and 2.2, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2-carbamoylethyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 81690-92-8

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	56.7 (53.4-60.2)	53.2 (50.4-56.2)	92.7 (85.3-100)	162 (151-175)	218 (199-243)	3331
Age 12-19 years (2005 - 2006)	52.6 (48.7-56.9)	50.7 (47.0-55.6)	80.6 (76.8-87.0)	127 (117-145)	174 (152-227)	1027
Age 20+ years (2005 - 2006)	57.4 (53.6-61.5)	53.6 (50.4-57.0)	95.0 (87.2-104)	166 (153-177)	221 (199-251)	2303
Males (2005 - 2006)	57.1 (53.5-61.0)	51.7 (48.8-56.2)	91.3 (81.5-103)	167 (152-183)	232 (199-261)	1583
Females (2005 - 2006)	56.3 (52.6-60.3)	54.7 (51.6-57.3)	94.6 (87.8-103)	154 (138-173)	210 (192-235)	1748
Mexican Americans (2005 - 2006)	53.7 (47.7-60.4)	55.4 (49.9-62.6)	84.4 (75.3-91.2)	130 (106-156)	162 (138-194)	816
Non-Hispanic blacks (2005 - 2006)	52.2 (48.1-56.7)	51.0 (46.1-55.2)	88.1 (76.8-101)	153 (127-176)	202 (177-237)	896
Non-Hispanic whites (2005 - 2006)	59.8 (55.5-64.3)	55.5 (51.0-60.5)	97.5 (88.1-108)	172 (154-193)	235 (205-261)	1364

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-carbamoyl-ethyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 81690-92-8

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	53.3 (50.3-56.4)	49.5 (47.4-51.7)	82.0 (76.6-89.4)	146 (127-168)	199 (167-237)	2464
Total population (2013 - 2014)	53.2 (48.1-58.9)	49.6 (44.9-54.1)	87.0 (78.1-97.1)	158 (133-192)	233 (197-277)	2510
Age 6-11 years (2011 - 2012)	56.8 (53.5-60.4)	52.8 (50.9-56.2)	77.9 (70.3-84.6)	119 (105-143)	173 (121-202)	393
Age 6-11 years (2013 - 2014)	54.3 (48.5-60.8)	52.9 (47.2-58.1)	81.0 (72.4-87.0)	116 (105-148)	153 (118-163)	385
Age 12-19 years (2011 - 2012)	52.1 (46.3-58.7)	48.2 (42.5-53.3)	81.1 (66.5-94.7)	133 (105-203)	203 (128-366)	384
Age 12-19 years (2013 - 2014)	46.0 (41.2-51.4)	41.6 (36.2-47.3)	72.0 (61.9-82.8)	131 (99.5-189)	201 (152-256)	426
Age 20+ years (2011 - 2012)	53.1 (49.7-56.6)	49.0 (46.0-52.0)	83.1 (76.6-91.5)	150 (129-173)	199 (162-262)	1687
Age 20+ years (2013 - 2014)	54.3 (48.6-60.6)	50.5 (45.8-55.4)	90.0 (79.6-102)	171 (139-209)	246 (212-293)	1699
Males (2011 - 2012)	52.3 (49.0-55.8)	48.4 (43.4-54.6)	82.5 (73.5-92.8)	145 (124-159)	187 (159-230)	1250
Males (2013 - 2014)	50.6 (45.6-56.1)	48.0 (42.1-53.5)	81.8 (72.7-92.3)	146 (123-171)	224 (176-255)	1239
Females (2011 - 2012)	54.3 (49.5-59.6)	50.3 (46.8-53.7)	82.0 (73.7-93.9)	155 (127-175)	210 (170-283)	1214
Females (2013 - 2014)	55.9 (49.9-62.6)	51.2 (46.5-54.8)	89.0 (79.6-105)	179 (138-210)	256 (199-313)	1271
Mexican Americans (2011 - 2012)	54.9 (45.6-66.1)	53.2 (45.3-61.0)	86.8 (69.9-104)	137 (104-183)	183 (135-215)	313
Mexican Americans (2013 - 2014)	57.6 (50.7-65.3)	56.3 (47.9-67.4)	87.6 (74.6-105)	137 (111-165)	178 (142-212)	425
Non-Hispanic blacks (2011 - 2012)	46.2 (42.7-50.0)	43.2 (41.0-46.4)	74.7 (66.4-80.8)	134 (110-156)	175 (148-210)	662
Non-Hispanic blacks (2013 - 2014)	54.8 (48.2-62.3)	51.1 (44.6-57.7)	91.9 (77.2-109)	157 (133-225)	277 (220-320)	551
Non-Hispanic whites (2011 - 2012)	56.8 (52.7-61.2)	51.7 (48.5-55.3)	88.1 (79.3-98.1)	159 (129-186)	215 (170-306)	808
Non-Hispanic whites (2013 - 2014)	53.9 (47.3-61.4)	49.9 (43.6-55.1)	88.1 (77.1-101)	170 (130-222)	248 (195-310)	922
All Hispanics (2011 - 2012)	48.6 (41.8-56.3)	46.4 (42.0-50.7)	76.5 (65.7-87.6)	122 (101-143)	173 (127-215)	566
All Hispanics (2013 - 2014)	52.4 (46.9-58.6)	50.6 (45.8-57.5)	84.3 (73.6-98.0)	135 (112-176)	195 (145-233)	656
Asians (2011 - 2012)	42.5 (38.4-47.0)	40.9 (35.5-45.1)	69.0 (58.1-79.3)	106 (94.3-126)	154 (124-166)	341
Asians (2013 - 2014)	46.1 (40.9-52.0)	43.0 (37.1-50.3)	75.2 (59.1-96.6)	119 (105-139)	158 (119-183)	280

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine (2005 – 2006)

CAS Number 81690-92-8

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	12.4 (10.9-13.9)	24.8 (23.0-26.5)	42.7 (38.2-48.6)	59.5 (54.4-64.1)	3349
Age 12-19 years (2005 - 2006)	15.4 (13.7-17.3)	15.1 (12.0-18.1)	27.3 (23.4-31.4)	42.2 (36.6-49.2)	55.9 (45.2-75.7)	1036
Age 20+ years (2005 - 2006)	*	11.8 (10.7-13.3)	24.6 (22.9-26.0)	42.9 (38.9-49.3)	60.1 (54.4-65.3)	2312
Males (2005 - 2006)	15.9 (15.1-16.7)	15.2 (13.7-16.6)	28.0 (25.7-32.4)	47.6 (42.5-53.3)	65.3 (56.0-80.9)	1592
Females (2005 - 2006)	*	10.1 (<LOD-11.8)	21.3 (18.8-23.4)	37.0 (31.8-44.5)	55.4 (44.5-61.2)	1756
Mexican Americans (2005 - 2006)	*	11.8 (10.3-13.7)	21.8 (18.6-26.5)	40.9 (34.8-45.3)	51.6 (44.2-59.5)	821
Non-Hispanic blacks (2005 - 2006)	16.8 (15.4-18.3)	16.6 (14.3-19.1)	30.6 (26.7-34.2)	51.3 (43.0-60.1)	67.0 (59.5-77.4)	902
Non-Hispanic whites (2005 - 2006)	*	12.4 (10.7-14.1)	24.8 (22.8-26.5)	42.5 (37.3-49.3)	57.2 (50.7-66.4)	1370

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 9.4.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine (2011 – 2014)

CAS Number 81690-92-8

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	14.2 (13.0-15.5)	25.5 (24.1-27.7)	37.0 (31.2-45.0)	2466
Total population (2013 - 2014)	*	< LOD	14.4 (13.0-15.4)	26.7 (23.0-29.0)	35.4 (31.8-41.1)	2636
Age 6-11 years (2011 - 2012)	*	< LOD	13.8 (12.6-15.2)	22.0 (17.9-26.0)	29.4 (21.1-35.1)	394
Age 6-11 years (2013 - 2014)	*	< LOD	12.6 (10.3-15.0)	21.9 (16.8-26.6)	27.6 (22.4-32.2)	398
Age 12-19 years (2011 - 2012)	*	9.47 (<LOD-11.8)	16.1 (13.2-20.5)	28.3 (22.2-37.8)	39.3 (30.0-49.1)	384
Age 12-19 years (2013 - 2014)	*	< LOD	14.6 (12.6-16.0)	23.5 (18.9-32.2)	33.0 (24.9-50.5)	447
Age 20+ years (2011 - 2012)	*	< LOD	13.9 (12.6-15.4)	25.1 (22.9-28.3)	37.3 (30.1-49.2)	1688
Age 20+ years (2013 - 2014)	*	< LOD	14.5 (12.9-15.8)	27.3 (23.9-30.8)	37.6 (31.8-42.9)	1791
Males (2011 - 2012)	*	< LOD	15.2 (13.9-17.2)	25.2 (22.9-28.2)	36.6 (30.3-43.2)	1251
Males (2013 - 2014)	*	< LOD	14.4 (12.8-15.4)	27.6 (24.5-30.1)	37.8 (32.3-43.5)	1309
Females (2011 - 2012)	*	< LOD	12.9 (12.1-14.7)	25.9 (21.1-29.2)	38.4 (29.3-51.3)	1215
Females (2013 - 2014)	*	< LOD	14.5 (12.5-15.9)	25.5 (21.2-29.5)	34.3 (28.7-42.2)	1327
Mexican Americans (2011 - 2012)	*	9.53 (<LOD-10.3)	14.6 (12.6-17.4)	22.4 (17.4-30.0)	30.0 (22.4-41.3)	313
Mexican Americans (2013 - 2014)	*	< LOD	15.2 (12.3-18.6)	24.7 (18.8-30.6)	30.6 (26.2-36.0)	451
Non-Hispanic blacks (2011 - 2012)	*	9.70 (<LOD-11.3)	16.9 (14.4-20.1)	30.6 (26.3-36.2)	43.2 (37.0-52.4)	662
Non-Hispanic blacks (2013 - 2014)	*	9.88 (<LOD-10.5)	18.9 (15.1-22.8)	33.0 (27.9-44.5)	52.5 (38.8-57.7)	571
Non-Hispanic whites (2011 - 2012)	*	< LOD	14.4 (12.5-16.6)	25.9 (23.6-28.3)	38.3 (29.2-53.0)	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	14.1 (12.1-16.1)	27.0 (21.7-30.9)	35.3 (31.5-42.5)	973
All Hispanics (2011 - 2012)	*	< LOD	13.5 (12.0-15.3)	21.9 (17.4-28.9)	30.0 (23.8-37.1)	566
All Hispanics (2013 - 2014)	*	< LOD	15.0 (12.7-16.6)	24.7 (19.6-29.2)	31.6 (26.6-38.0)	699
Asians (2011 - 2012)	*	< LOD	9.93 (<LOD-11.0)	13.9 (12.9-15.5)	17.3 (14.7-24.1)	341
Asians (2013 - 2014)	*	< LOD	< LOD	13.0 (11.0-15.4)	17.3 (13.7-21.6)	289

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 9.4 and 9.4, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 81690-92-8

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	13.9 (13.3-14.8)	22.3 (21.2-23.8)	33.6 (31.6-35.9)	42.6 (40.0-45.1)	3337
Age 12-19 years (2005 - 2006)	11.8 (10.9-12.8)	12.1 (11.3-12.7)	17.8 (16.6-19.0)	27.0 (24.5-30.6)	33.1 (30.6-35.7)	1030
Age 20+ years (2005 - 2006)	*	14.4 (13.6-15.1)	23.4 (21.8-24.6)	35.0 (32.6-37.1)	44.3 (41.2-46.5)	2307
Males (2005 - 2006)	13.0 (12.3-13.7)	12.9 (12.3-13.6)	20.5 (19.0-22.2)	31.6 (28.5-34.2)	39.1 (36.9-40.7)	1585
Females (2005 - 2006)	*	15.1 (<LOD-16.2)	24.6 (22.2-26.5)	35.2 (32.9-39.1)	45.8 (42.6-49.7)	1752
Mexican Americans (2005 - 2006)	*	12.5 (11.5-13.6)	18.9 (17.0-20.9)	26.8 (22.9-31.7)	34.4 (28.5-41.5)	818
Non-Hispanic blacks (2005 - 2006)	11.6 (11.1-12.0)	11.2 (10.3-12.1)	18.2 (17.1-20.2)	28.5 (26.0-31.5)	37.7 (32.2-42.8)	899
Non-Hispanic whites (2005 - 2006)	*	14.8 (13.9-15.8)	24.0 (22.2-25.6)	35.0 (32.9-37.9)	44.8 (40.1-48.3)	1365

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 81690-92-8

Metabolite of Acrylamide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	18.0 (17.0-19.2)	28.9 (25.6-33.6)	39.1 (35.9-42.0)	2464
Total population (2013 - 2014)	*	< LOD	18.5 (16.6-20.2)	28.7 (26.6-31.1)	39.1 (35.0-44.3)	2635
Age 6-11 years (2011 - 2012)	*	< LOD	20.2 (18.5-22.4)	33.3 (24.6-40.0)	40.0 (35.0-59.5)	393
Age 6-11 years (2013 - 2014)	*	< LOD	20.8 (18.0-22.9)	30.2 (23.8-39.1)	39.1 (31.7-44.3)	398
Age 12-19 years (2011 - 2012)	*	10.1 (<LOD-11.3)	16.2 (13.1-17.7)	29.4 (19.6-39.1)	40.5 (26.6-73.9)	384
Age 12-19 years (2013 - 2014)	*	< LOD	13.8 (12.8-15.1)	21.0 (19.0-25.6)	31.7 (22.2-38.6)	447
Age 20+ years (2011 - 2012)	*	< LOD	18.0 (17.0-19.6)	28.0 (24.6-34.1)	37.3 (34.6-42.0)	1687
Age 20+ years (2013 - 2014)	*	< LOD	18.7 (16.6-20.2)	29.2 (26.7-31.7)	39.1 (35.1-47.5)	1790
Males (2011 - 2012)	*	< LOD	15.4 (14.2-16.6)	23.2 (21.0-26.0)	33.3 (26.7-37.3)	1250
Males (2013 - 2014)	*	< LOD	15.8 (14.8-16.6)	23.3 (21.5-26.7)	34.1 (27.8-41.4)	1308
Females (2011 - 2012)	*	< LOD	21.5 (19.1-22.9)	34.6 (28.9-37.7)	46.8 (38.7-51.2)	1214
Females (2013 - 2014)	*	< LOD	20.5 (18.5-23.4)	31.7 (28.7-36.9)	41.6 (36.9-51.2)	1327
Mexican Americans (2011 - 2012)	*	11.7 (<LOD-12.6)	16.1 (13.3-20.0)	25.2 (19.3-30.5)	30.5 (23.1-35.8)	313
Mexican Americans (2013 - 2014)	*	< LOD	17.5 (15.8-19.6)	24.6 (22.4-26.6)	30.7 (24.4-54.3)	451
Non-Hispanic blacks (2011 - 2012)	*	8.61 (<LOD-9.33)	14.1 (12.1-16.0)	21.5 (19.7-23.5)	25.5 (24.3-31.6)	662
Non-Hispanic blacks (2013 - 2014)	*	9.06 (<LOD-10.1)	14.1 (12.5-15.6)	21.5 (18.0-24.3)	27.1 (22.2-38.1)	571
Non-Hispanic whites (2011 - 2012)	*	< LOD	19.5 (17.8-21.0)	31.7 (26.6-35.9)	41.0 (36.9-47.5)	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	19.6 (17.4-21.0)	31.7 (28.6-35.1)	43.7 (36.9-48.7)	972
All Hispanics (2011 - 2012)	*	< LOD	15.9 (13.9-18.5)	25.5 (20.2-30.2)	30.5 (25.6-36.9)	566
All Hispanics (2013 - 2014)	*	< LOD	17.1 (15.8-18.5)	25.6 (22.4-27.0)	31.5 (25.6-47.5)	699
Asians (2011 - 2012)	*	< LOD	16.6 (<LOD-19.3)	27.7 (22.2-32.6)	36.9 (27.7-47.5)	341
Asians (2013 - 2014)	*	< LOD	< LOD	27.7 (24.6-31.7)	35.0 (29.1-55.4)	289

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Acrylamide_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Acrylamide_FactSheet.html

Urinary N-Acetyl-S-(2-cyanoethyl)-L-cysteine (2005 – 2006)

CAS Number 74514-75-3

Metabolite of Acrylonitrile

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	4.03 (3.37-4.83)	1.92 (1.72-2.09)	13.1 (6.17-31.1)	170 (143-200)	293 (242-349)	3345
Age 12-19 years (2005 - 2006)	2.93 (2.35-3.64)	1.98 (1.68-2.30)	4.37 (3.26-6.02)	48.1 (17.7-86.6)	139 (81.0-183)	1030
Age 20+ years (2005 - 2006)	4.24 (3.48-5.17)	1.92 (1.67-2.14)	20.5 (6.97-49.5)	189 (157-223)	316 (255-366)	2312
Males (2005 - 2006)	5.54 (4.45-6.89)	2.33 (1.97-2.76)	44.6 (12.8-71.4)	196 (160-231)	319 (259-362)	1587
Females (2005 - 2006)	2.98 (2.49-3.56)	1.53 (1.32-1.78)	5.15 (3.37-9.01)	139 (90.9-176)	268 (192-363)	1754
Mexican Americans (2005 - 2006)	2.60 (2.24-3.03)	1.68 (1.58-1.79)	3.84 (3.24-4.99)	45.5 (17.1-85.4)	126 (70.6-172)	818
Non-Hispanic blacks (2005 - 2006)	6.95 (5.55-8.69)	2.87 (2.45-3.78)	48.4 (17.4-79.0)	220 (169-286)	387 (252-481)	900
Non-Hispanic whites (2005 - 2006)	4.04 (3.18-5.13)	1.78 (1.62-2.01)	19.2 (5.56-49.8)	176 (146-223)	311 (249-355)	1367

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 0.5.

Urinary N-Acetyl-S-(2-cyanoethyl)-L-cysteine (2011 – 2014)

CAS Number 74514-75-3

Metabolite of Acrylonitrile

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	3.40 (2.97-3.90)	1.71 (1.61-1.86)	5.42 (4.03-8.55)	136 (100-172)	276 (238-323)	2466
Total population (2013 - 2014)	3.18 (2.79-3.62)	1.65 (1.50-1.81)	5.29 (4.19-6.62)	111 (90.0-130)	234 (182-274)	2576
Age 6-11 years (2011 - 2012)	1.47 (1.35-1.60)	1.38 (1.30-1.58)	2.44 (2.18-2.90)	4.27 (3.15-5.40)	6.71 (4.26-9.62)	394
Age 6-11 years (2013 - 2014)	1.37 (1.20-1.55)	1.31 (1.04-1.65)	2.28 (1.88-2.83)	4.17 (3.58-5.10)	6.25 (4.63-8.17)	387
Age 12-19 years (2011 - 2012)	2.65 (2.07-3.39)	1.68 (1.36-2.13)	3.79 (2.90-5.85)	40.6 (9.71-88.9)	135 (43.9-276)	384
Age 12-19 years (2013 - 2014)	2.42 (1.84-3.18)	1.67 (1.38-2.16)	3.74 (2.50-6.23)	21.8 (6.50-124)	149 (22.6-182)	438
Age 20+ years (2011 - 2012)	3.87 (3.32-4.52)	1.78 (1.61-1.98)	10.3 (5.71-19.9)	164 (131-203)	310 (239-385)	1688
Age 20+ years (2013 - 2014)	3.61 (3.13-4.17)	1.69 (1.52-1.89)	8.30 (5.68-13.9)	126 (105-162)	265 (201-323)	1751
Males (2011 - 2012)	4.27 (3.60-5.06)	2.14 (1.92-2.35)	9.79 (5.39-17.1)	166 (117-207)	294 (217-439)	1251
Males (2013 - 2014)	3.52 (2.96-4.19)	1.83 (1.62-2.04)	6.69 (4.64-9.71)	101 (76.0-139)	218 (161-310)	1276
Females (2011 - 2012)	2.73 (2.16-3.46)	1.42 (1.26-1.61)	3.72 (2.83-5.55)	118 (74.4-142)	260 (142-310)	1215
Females (2013 - 2014)	2.88 (2.41-3.45)	1.50 (1.30-1.72)	4.34 (3.47-6.02)	113 (80.7-153)	234 (162-278)	1300
Mexican Americans (2011 - 2012)	2.51 (1.88-3.36)	1.61 (1.31-1.87)	3.50 (2.74-6.61)	51.6 (12.6-105)	105 (38.8-174)	313
Mexican Americans (2013 - 2014)	1.95 (1.62-2.35)	1.45 (1.23-1.74)	2.67 (2.21-3.31)	29.8 (4.90-64.3)	92.2 (36.8-126)	447
Non-Hispanic blacks (2011 - 2012)	5.02 (3.99-6.32)	2.63 (2.16-3.11)	9.18 (5.27-24.4)	166 (123-228)	339 (234-429)	662
Non-Hispanic blacks (2013 - 2014)	6.86 (5.80-8.11)	2.82 (2.45-3.35)	46.8 (23.7-72.5)	249 (156-318)	449 (310-548)	558
Non-Hispanic whites (2011 - 2012)	3.46 (2.95-4.07)	1.63 (1.47-1.82)	6.33 (3.97-12.6)	146 (117-203)	280 (228-350)	810
Non-Hispanic whites (2013 - 2014)	3.18 (2.60-3.88)	1.58 (1.38-1.85)	5.89 (3.90-9.93)	113 (80.7-153)	232 (165-280)	935
All Hispanics (2011 - 2012)	2.57 (2.01-3.28)	1.57 (1.41-1.79)	3.49 (2.78-5.42)	58.5 (17.3-105)	158 (74.3-253)	566
All Hispanics (2013 - 2014)	2.24 (1.75-2.87)	1.53 (1.33-1.76)	2.97 (2.53-3.75)	40.2 (7.93-90.0)	121 (53.2-212)	693
Asians (2011 - 2012)	1.90 (1.65-2.21)	1.40 (1.24-1.65)	2.73 (2.18-3.10)	12.3 (4.53-48.4)	91.4 (24.4-133)	341
Asians (2013 - 2014)	1.57 (1.21-2.03)	1.26 (1.03-1.53)	2.48 (1.85-2.85)	5.91 (2.99-50.1)	50.1 (4.89-177)	286

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.5 and 0.5, respectively.

Urinary N-Acetyl-S-(2-cyanoethyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 74514-75-3

Metabolite of Acrylonitrile

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	4.04 (3.38-4.84)	1.61 (1.46-1.82)	10.2 (4.55-34.4)	159 (124-192)	271 (234-290)	3334
Age 12-19 years (2005 - 2006)	2.24 (1.89-2.66)	1.33 (1.22-1.42)	3.24 (2.29-4.51)	37.4 (13.4-57.2)	86.9 (57.2-119)	1029
Age 20+ years (2005 - 2006)	4.44 (3.64-5.41)	1.67 (1.50-1.88)	21.2 (5.38-52.1)	182 (147-206)	281 (250-306)	2305
Males (2005 - 2006)	4.53 (3.61-5.70)	1.59 (1.41-1.84)	35.4 (8.66-63.0)	165 (124-196)	235 (206-281)	1583
Females (2005 - 2006)	3.62 (3.02-4.34)	1.63 (1.43-1.89)	4.41 (3.26-8.17)	147 (115-188)	284 (242-316)	1751
Mexican Americans (2005 - 2006)	2.34 (1.96-2.79)	1.42 (1.32-1.49)	3.03 (2.64-3.96)	31.7 (11.7-73.5)	91.0 (44.2-126)	817
Non-Hispanic blacks (2005 - 2006)	4.79 (3.95-5.81)	1.83 (1.51-2.46)	35.3 (10.2-63.3)	147 (109-183)	217 (183-259)	897
Non-Hispanic whites (2005 - 2006)	4.36 (3.41-5.56)	1.61 (1.43-1.94)	19.1 (4.11-57.2)	184 (138-225)	287 (259-315)	1365

Urinary N-Acetyl-S-(2-cyanoethyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 74514-75-3

Metabolite of Acrylonitrile

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	3.89 (3.44-4.40)	1.83 (1.73-1.93)	5.28 (4.08-7.59)	157 (119-194)	256 (224-300)	2464
Total population (2013 - 2014)	3.72 (3.29-4.20)	1.87 (1.71-2.02)	5.83 (4.37-8.61)	121 (97.0-144)	227 (180-286)	2575
Age 6-11 years (2011 - 2012)	2.11 (1.91-2.33)	2.00 (1.81-2.22)	2.95 (2.53-3.59)	5.00 (3.92-5.78)	6.31 (5.74-7.95)	393
Age 6-11 years (2013 - 2014)	2.04 (1.80-2.31)	1.87 (1.62-2.29)	3.18 (2.77-3.97)	5.74 (4.30-7.22)	7.27 (5.91-9.83)	387
Age 12-19 years (2011 - 2012)	2.58 (2.10-3.18)	1.73 (1.51-1.88)	3.28 (2.35-5.84)	19.3 (7.61-58.9)	157 (17.6-228)	384
Age 12-19 years (2013 - 2014)	2.21 (1.77-2.75)	1.46 (1.29-1.78)	3.47 (2.35-4.83)	14.1 (5.53-84.7)	89.7 (15.1-152)	438
Age 20+ years (2011 - 2012)	4.43 (3.85-5.09)	1.82 (1.66-2.00)	8.86 (5.46-20.6)	188 (151-224)	292 (238-339)	1687
Age 20+ years (2013 - 2014)	4.27 (3.74-4.87)	1.95 (1.76-2.08)	9.07 (6.10-17.0)	144 (122-176)	272 (215-332)	1750
Males (2011 - 2012)	4.02 (3.34-4.83)	1.76 (1.61-1.93)	7.71 (4.18-20.2)	153 (116-220)	238 (220-278)	1250
Males (2013 - 2014)	3.56 (3.05-4.15)	1.73 (1.56-1.97)	6.39 (4.64-8.89)	110 (67.2-146)	228 (168-281)	1275
Females (2011 - 2012)	3.77 (3.01-4.73)	1.87 (1.71-2.09)	4.37 (3.22-6.59)	158 (86.4-228)	292 (229-315)	1214
Females (2013 - 2014)	3.88 (3.21-4.68)	1.95 (1.72-2.21)	5.43 (3.91-9.19)	135 (91.6-172)	223 (176-353)	1300
Mexican Americans (2011 - 2012)	2.84 (2.20-3.66)	1.65 (1.49-1.86)	3.52 (2.40-7.27)	41.8 (20.0-93.2)	128 (39.4-345)	313
Mexican Americans (2013 - 2014)	2.24 (1.85-2.71)	1.44 (1.33-1.53)	2.72 (2.07-3.68)	26.4 (6.62-57.4)	71.0 (36.3-184)	447
Non-Hispanic blacks (2011 - 2012)	3.91 (3.18-4.81)	1.92 (1.74-2.10)	7.14 (3.58-33.5)	120 (92.2-139)	199 (145-241)	662
Non-Hispanic blacks (2013 - 2014)	5.26 (4.35-6.34)	2.28 (2.00-2.79)	31.0 (13.5-60.5)	177 (121-226)	280 (206-387)	558
Non-Hispanic whites (2011 - 2012)	4.25 (3.67-4.92)	1.85 (1.74-1.97)	6.40 (4.02-13.7)	200 (157-230)	292 (238-342)	808
Non-Hispanic whites (2013 - 2014)	3.98 (3.35-4.72)	1.95 (1.74-2.18)	7.21 (4.45-12.0)	126 (99.3-172)	260 (179-332)	934
All Hispanics (2011 - 2012)	2.88 (2.37-3.49)	1.62 (1.53-1.78)	3.38 (2.65-4.56)	54.1 (31.6-91.7)	146 (67.8-230)	566
All Hispanics (2013 - 2014)	2.51 (1.96-3.23)	1.49 (1.40-1.69)	2.97 (2.28-4.51)	43.2 (8.51-89.7)	146 (51.3-235)	693
Asians (2011 - 2012)	2.55 (2.26-2.87)	1.76 (1.61-2.15)	3.50 (2.89-4.18)	13.0 (5.64-37.8)	68.0 (26.8-98.5)	341
Asians (2013 - 2014)	2.46 (1.94-3.12)	1.97 (1.61-2.31)	3.22 (2.72-4.12)	9.28 (4.23-82.3)	82.3 (8.63-144)	286

Urinary N-Acetyl-S-(2-hydroxyethyl)-L-cysteine (2005 – 2006)

CAS Number 15060-26-1

Metabolite of Acrylonitrile, Ethylene oxide, and Vinyl chloride

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	.960 (<LOD-1.61)	3.30 (2.84-3.93)	5.95 (5.16-6.71)	3347
Age 12-19 years (2005 - 2006)	*	< LOD	1.35 (<LOD-2.24)	3.46 (3.04-4.08)	5.11 (4.03-5.98)	1036
Age 20+ years (2005 - 2006)	*	< LOD	.888 (<LOD-1.53)	3.23 (2.63-4.11)	6.23 (5.43-7.21)	2311
Males (2005 - 2006)	*	< LOD	.799 (<LOD-1.69)	3.12 (2.32-3.92)	5.15 (4.08-6.53)	1590
Females (2005 - 2006)	*	< LOD	1.10 (<LOD-1.65)	3.57 (2.92-4.58)	6.65 (5.24-7.93)	1756
Mexican Americans (2005 - 2006)	*	< LOD	1.22 (<LOD-1.91)	3.29 (2.59-3.88)	4.64 (3.88-5.68)	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	1.35 (<LOD-2.99)	4.47 (3.00-6.03)	6.63 (4.68-11.6)	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	.815 (<LOD-1.73)	3.23 (2.56-4.09)	6.22 (5.10-7.21)	1369

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 0.791.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxyethyl)-L-cysteine (2011 – 2014)

CAS Number 15060-26-1

Metabolite of Acrylonitrile, Ethylene oxide, and Vinyl chloride

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	.920 (.815-1.05)	1.77 (1.61-1.94)	3.70 (3.19-4.65)	6.19 (5.31-7.07)	2466
Total population (2013 - 2014)	*	< LOD	1.39 (1.26-1.56)	3.06 (2.64-3.56)	4.68 (3.99-6.06)	2586
Age 6-11 years (2011 - 2012)	1.20 (1.06-1.36)	1.18 (1.00-1.27)	1.89 (1.62-2.33)	3.23 (2.73-3.96)	4.61 (3.46-5.12)	394
Age 6-11 years (2013 - 2014)	*	< LOD	1.41 (1.24-1.91)	2.40 (2.07-2.90)	3.45 (2.72-4.23)	384
Age 12-19 years (2011 - 2012)	1.28 (1.11-1.46)	1.19 (.920-1.32)	2.09 (1.67-2.60)	3.77 (2.89-5.38)	6.08 (4.91-7.45)	384
Age 12-19 years (2013 - 2014)	*	< LOD	1.59 (1.25-1.89)	3.23 (2.84-3.77)	4.39 (3.48-5.40)	439
Age 20+ years (2011 - 2012)	*	.895 (<LOD-1.01)	1.70 (1.45-1.95)	3.76 (3.10-4.78)	6.53 (5.38-7.71)	1688
Age 20+ years (2013 - 2014)	*	< LOD	1.38 (1.22-1.54)	3.07 (2.57-3.72)	4.87 (4.03-6.30)	1763
Males (2011 - 2012)	*	.916 (<LOD-1.10)	1.71 (1.49-1.95)	3.35 (2.67-4.07)	5.31 (4.23-6.78)	1251
Males (2013 - 2014)	*	< LOD	1.34 (1.12-1.57)	2.67 (2.24-3.19)	4.23 (3.47-4.95)	1285
Females (2011 - 2012)	*	.943 (<LOD-1.13)	1.83 (1.58-2.17)	4.53 (3.46-5.15)	6.83 (5.15-8.74)	1215
Females (2013 - 2014)	*	< LOD	1.49 (1.30-1.77)	3.30 (2.82-4.08)	5.31 (4.16-7.15)	1301
Mexican Americans (2011 - 2012)	1.20 (1.05-1.38)	1.04 (.936-1.18)	1.86 (1.49-2.24)	3.93 (2.85-4.91)	5.24 (4.78-6.48)	313
Mexican Americans (2013 - 2014)	*	< LOD	1.49 (1.38-1.63)	2.67 (2.03-3.06)	3.31 (2.82-4.18)	449
Non-Hispanic blacks (2011 - 2012)	1.43 (1.28-1.60)	1.29 (1.12-1.51)	2.41 (2.01-2.88)	4.78 (3.62-7.07)	8.62 (6.46-10.0)	662
Non-Hispanic blacks (2013 - 2014)	*	.995 (.821-1.23)	2.13 (1.75-2.60)	4.68 (3.37-5.99)	7.05 (5.92-8.88)	553
Non-Hispanic whites (2011 - 2012)	*	.883 (<LOD-1.01)	1.65 (1.43-1.87)	3.64 (2.89-4.65)	6.11 (5.03-7.45)	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	1.25 (1.12-1.45)	2.94 (2.18-3.60)	4.59 (3.51-6.34)	953
All Hispanics (2011 - 2012)	*	.964 (.854-1.08)	1.75 (1.46-2.12)	3.49 (2.88-4.62)	5.24 (3.93-7.06)	566
All Hispanics (2013 - 2014)	*	< LOD	1.50 (1.39-1.77)	2.81 (2.16-3.62)	3.95 (2.82-5.70)	695
Asians (2011 - 2012)	*	< LOD	1.29 (1.14-1.41)	2.33 (1.62-2.73)	3.35 (2.53-4.80)	341
Asians (2013 - 2014)	*	< LOD	1.01 (<LOD-1.31)	1.99 (1.54-2.80)	3.64 (2.40-4.23)	283

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.791 and 0.791, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxyethyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 15060-26-1

Metabolite of Acrylonitrile, Ethylene oxide, and Vinyl chloride

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	1.60 (<LOD-2.03)	3.32 (2.94-4.03)	5.70 (4.44-6.76)	3344
Age 12-19 years (2005 - 2006)	*	< LOD	1.36 (<LOD-1.74)	2.53 (2.08-3.04)	3.81 (2.78-4.64)	1034
Age 20+ years (2005 - 2006)	*	< LOD	1.64 (<LOD-2.07)	3.49 (2.94-4.35)	5.98 (4.51-7.52)	2310
Males (2005 - 2006)	*	< LOD	1.14 (<LOD-1.47)	2.46 (2.10-3.25)	4.11 (3.29-5.97)	1588
Females (2005 - 2006)	*	< LOD	2.05 (<LOD-2.43)	4.21 (3.49-4.95)	6.20 (5.19-8.73)	1756
Mexican Americans (2005 - 2006)	*	< LOD	1.47 (<LOD-1.66)	2.66 (2.33-3.09)	4.30 (2.95-5.66)	819
Non-Hispanic blacks (2005 - 2006)	*	< LOD	1.21 (<LOD-2.13)	2.80 (2.18-3.99)	4.45 (3.10-5.91)	900
Non-Hispanic whites (2005 - 2006)	*	< LOD	1.69 (<LOD-2.15)	3.62 (2.94-4.57)	6.21 (4.66-7.80)	1369

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxyethyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 15060-26-1

Metabolite of Acrylonitrile, Ethylene oxide, and Vinyl chloride

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	1.24 (1.17-1.33)	2.24 (2.07-2.41)	4.18 (3.76-4.57)	6.38 (5.08-7.70)	2464
Total population (2013 - 2014)	*	< LOD	1.88 (1.74-2.07)	3.45 (3.11-3.99)	5.10 (4.56-6.21)	2585
Age 6-11 years (2011 - 2012)	1.69 (1.50-1.91)	1.69 (1.46-1.90)	2.65 (2.26-3.16)	3.90 (3.26-4.66)	5.11 (3.81-7.06)	393
Age 6-11 years (2013 - 2014)	*	< LOD	2.44 (2.00-2.66)	3.73 (2.95-4.45)	4.56 (3.52-5.68)	384
Age 12-19 years (2011 - 2012)	1.24 (1.13-1.37)	1.17 (.998-1.28)	2.01 (1.62-2.49)	3.62 (2.79-5.53)	6.21 (3.86-7.99)	384
Age 12-19 years (2013 - 2014)	*	< LOD	1.58 (1.43-1.74)	2.61 (2.15-3.06)	3.88 (2.67-6.21)	439
Age 20+ years (2011 - 2012)	*	1.20 (<LOD-1.33)	2.16 (2.00-2.43)	4.30 (3.77-4.97)	6.87 (5.21-7.73)	1687
Age 20+ years (2013 - 2014)	*	< LOD	1.87 (1.69-2.13)	3.58 (3.05-4.30)	5.59 (4.58-7.06)	1762
Males (2011 - 2012)	*	.984 (<LOD-1.12)	1.75 (1.55-2.05)	3.29 (3.05-3.55)	4.90 (4.03-5.93)	1250
Males (2013 - 2014)	*	< LOD	1.55 (1.42-1.67)	2.80 (2.33-3.49)	4.30 (3.75-5.08)	1284
Females (2011 - 2012)	*	1.47 (<LOD-1.61)	2.60 (2.33-2.96)	5.08 (3.94-6.96)	7.35 (5.29-11.6)	1214
Females (2013 - 2014)	*	< LOD	2.24 (1.95-2.54)	4.13 (3.29-4.86)	6.79 (4.86-9.56)	1301
Mexican Americans (2011 - 2012)	1.36 (1.17-1.57)	1.27 (1.14-1.46)	2.26 (1.90-2.62)	3.98 (2.94-5.66)	6.05 (4.21-7.37)	313
Mexican Americans (2013 - 2014)	*	< LOD	1.75 (1.56-1.93)	2.66 (2.16-3.14)	3.97 (3.00-4.78)	449
Non-Hispanic blacks (2011 - 2012)	1.12 (1.03-1.21)	.994 (.890-1.15)	1.99 (1.69-2.19)	3.77 (3.26-4.36)	5.33 (4.45-5.97)	662
Non-Hispanic blacks (2013 - 2014)	*	.883 (.717-.981)	1.69 (1.32-2.26)	3.58 (2.62-4.33)	5.12 (3.99-6.78)	553
Non-Hispanic whites (2011 - 2012)	*	1.30 (<LOD-1.40)	2.24 (2.07-2.52)	4.30 (3.49-5.08)	6.79 (4.53-8.85)	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	1.93 (1.69-2.23)	3.52 (3.06-4.19)	5.59 (4.24-7.69)	952
All Hispanics (2011 - 2012)	*	1.21 (1.10-1.40)	2.13 (1.84-2.43)	3.66 (2.94-4.52)	5.83 (4.18-6.96)	566
All Hispanics (2013 - 2014)	*	< LOD	1.70 (1.55-1.90)	2.96 (2.24-3.99)	4.66 (3.25-5.60)	695
Asians (2011 - 2012)	*	< LOD	1.93 (1.69-2.50)	3.29 (2.54-4.30)	4.77 (3.30-7.99)	341
Asians (2013 - 2014)	*	< LOD	2.20 (<LOD-2.54)	3.87 (2.54-5.08)	5.15 (4.36-9.74)	283

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(phenyl)-L-cysteine (2005 – 2006)

CAS Number 4775-80-8

Metabolite of Benzene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	1.08 (.941-1.22)	1.61 (1.36-1.98)	3347
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	1.09 (.884-1.29)	1.52 (1.29-1.72)	1035
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	1.08 (.941-1.24)	1.64 (1.37-2.27)	2312
Males (2005 - 2006)	*	< LOD	< LOD	1.08 (.946-1.29)	1.64 (1.36-1.98)	1590
Females (2005 - 2006)	*	< LOD	< LOD	1.08 (.875-1.28)	1.60 (1.23-2.47)	1756
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	1.07 (.823-1.53)	1.64 (1.07-2.31)	821
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	.945 (.717-1.15)	1.38 (1.15-1.58)	902
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	1.10 (.982-1.31)	1.72 (1.36-2.45)	1370

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 0.6.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Benzene_FactSheet.html

Urinary N-Acetyl-S-(phenyl)-L-cysteine (2011 – 2014)

CAS Number 4775-80-8

Metabolite of Benzene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	1.07 (.985-1.14)	1.95 (1.72-2.30)	3.01 (2.65-3.32)	2466
Total population (2013 - 2014)	*	< LOD	.897 (.720-1.07)	1.52 (1.27-1.93)	2.20 (1.77-3.12)	2561
Age 6-11 years (2011 - 2012)	*	< LOD	1.28 (1.10-1.52)	2.36 (1.93-2.63)	2.98 (2.40-3.67)	394
Age 6-11 years (2013 - 2014)	*	< LOD	1.13 (.855-1.51)	1.83 (1.51-2.44)	2.92 (1.86-4.14)	385
Age 12-19 years (2011 - 2012)	*	< LOD	1.12 (.963-1.41)	1.96 (1.57-2.52)	2.81 (2.03-3.27)	384
Age 12-19 years (2013 - 2014)	*	< LOD	1.03 (.770-1.24)	1.63 (1.28-2.29)	2.60 (1.84-3.53)	435
Age 20+ years (2011 - 2012)	*	< LOD	1.02 (.943-1.12)	1.91 (1.63-2.40)	3.05 (2.56-3.45)	1688
Age 20+ years (2013 - 2014)	*	< LOD	.850 (.670-1.03)	1.50 (1.20-1.92)	2.08 (1.67-2.99)	1741
Males (2011 - 2012)	*	.645 (<LOD-.765)	1.20 (1.07-1.28)	2.12 (1.76-2.51)	3.11 (2.65-3.76)	1251
Males (2013 - 2014)	*	< LOD	.969 (.766-1.17)	1.57 (1.33-2.10)	2.32 (1.79-3.48)	1273
Females (2011 - 2012)	*	< LOD	.964 (.834-1.07)	1.91 (1.56-2.38)	2.84 (2.12-3.32)	1215
Females (2013 - 2014)	*	< LOD	.832 (.669-.997)	1.50 (1.17-1.91)	2.08 (1.67-2.84)	1288
Mexican Americans (2011 - 2012)	*	.661 (<LOD-.958)	1.44 (.995-1.68)	2.54 (1.75-2.93)	2.96 (2.52-5.19)	313
Mexican Americans (2013 - 2014)	*	< LOD	1.12 (.896-1.40)	2.07 (1.45-3.06)	3.29 (2.20-4.29)	431
Non-Hispanic blacks (2011 - 2012)	*	< LOD	1.05 (.963-1.16)	1.84 (1.59-2.11)	2.62 (2.19-3.06)	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.857 (.717-1.02)	1.45 (1.12-2.08)	2.13 (1.50-2.81)	563
Non-Hispanic whites (2011 - 2012)	*	< LOD	1.04 (.931-1.13)	1.92 (1.61-2.40)	3.08 (2.44-3.50)	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	.876 (.664-1.03)	1.49 (1.15-1.91)	2.03 (1.54-3.35)	952
All Hispanics (2011 - 2012)	*	< LOD	1.20 (1.00-1.45)	2.26 (1.75-2.62)	2.85 (2.49-3.33)	566
All Hispanics (2013 - 2014)	*	< LOD	1.07 (.846-1.36)	1.85 (1.45-2.70)	2.99 (2.11-3.56)	665
Asians (2011 - 2012)	*	< LOD	.932 (.806-1.09)	1.84 (1.45-2.16)	2.56 (2.13-3.48)	341
Asians (2013 - 2014)	*	< LOD	.841 (<LOD-1.13)	1.45 (1.04-2.59)	2.30 (1.24-4.29)	280

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.6 and 0.6, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Urinary N-Acetyl-S-(phenyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 4775-80-8

Metabolite of Benzene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	1.55 (1.39-1.66)	2.02 (1.84-2.17)	3346
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	1.06 (.840-1.33)	1.36 (1.16-1.77)	1034
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	1.60 (1.47-1.70)	2.12 (1.93-2.23)	2311
Males (2005 - 2006)	*	< LOD	< LOD	1.15 (1.07-1.29)	1.59 (1.47-1.77)	1590
Females (2005 - 2006)	*	< LOD	< LOD	1.81 (1.63-1.93)	2.36 (2.02-2.74)	1756
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	1.21 (1.09-1.35)	1.64 (1.41-1.82)	819
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	.831 (.720-.925)	1.25 (.914-1.57)	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	1.63 (1.50-1.77)	2.12 (1.93-2.23)	1370

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Benzene_FactSheet.html

Urinary N-Acetyl-S-(phenyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 4775-80-8

Metabolite of Benzene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	1.29 (1.18-1.41)	2.10 (1.86-2.37)	3.03 (2.62-3.53)	2464
Total population (2013 - 2014)	*	< LOD	1.21 (1.06-1.40)	2.10 (1.85-2.41)	3.03 (2.54-3.52)	2560
Age 6-11 years (2011 - 2012)	*	< LOD	1.95 (1.64-2.24)	2.68 (2.44-3.45)	3.58 (2.66-4.71)	393
Age 6-11 years (2013 - 2014)	*	< LOD	1.96 (1.51-2.49)	2.92 (2.52-3.86)	4.21 (2.78-5.93)	385
Age 12-19 years (2011 - 2012)	*	< LOD	1.14 (.942-1.41)	1.70 (1.29-2.23)	2.35 (1.70-4.39)	384
Age 12-19 years (2013 - 2014)	*	< LOD	1.05 (.831-1.24)	1.83 (1.27-2.06)	2.06 (1.83-2.68)	435
Age 20+ years (2011 - 2012)	*	< LOD	1.26 (1.15-1.39)	2.02 (1.77-2.42)	3.03 (2.50-3.53)	1687
Age 20+ years (2013 - 2014)	*	< LOD	1.18 (1.02-1.34)	2.03 (1.75-2.36)	2.89 (2.41-3.50)	1740
Males (2011 - 2012)	*	.704 (<LOD-.771)	1.12 (1.00-1.25)	1.89 (1.64-2.21)	2.55 (2.23-2.98)	1250
Males (2013 - 2014)	*	< LOD	1.06 (.902-1.25)	1.90 (1.57-2.08)	2.53 (2.12-3.14)	1272
Females (2011 - 2012)	*	< LOD	1.46 (1.30-1.62)	2.35 (2.02-2.73)	3.46 (2.73-4.71)	1214
Females (2013 - 2014)	*	< LOD	1.34 (1.21-1.51)	2.36 (2.02-2.64)	3.41 (2.62-3.93)	1288
Mexican Americans (2011 - 2012)	*	.883 (<LOD-.986)	1.45 (1.15-1.82)	2.15 (1.66-3.04)	3.04 (1.93-5.59)	313
Mexican Americans (2013 - 2014)	*	< LOD	1.41 (1.12-1.74)	2.38 (1.85-2.82)	2.92 (2.29-4.06)	431
Non-Hispanic blacks (2011 - 2012)	*	< LOD	.847 (.742-.924)	1.35 (1.18-1.57)	1.88 (1.57-2.36)	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	.744 (.628-.924)	1.18 (1.01-1.42)	1.47 (1.22-1.93)	563
Non-Hispanic whites (2011 - 2012)	*	< LOD	1.36 (1.22-1.46)	2.23 (1.92-2.55)	3.26 (2.55-4.15)	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	1.25 (1.09-1.41)	2.20 (1.93-2.49)	3.14 (2.49-3.88)	951
All Hispanics (2011 - 2012)	*	< LOD	1.34 (1.11-1.64)	1.93 (1.68-2.62)	2.68 (2.04-3.39)	566
All Hispanics (2013 - 2014)	*	< LOD	1.32 (1.08-1.64)	2.19 (1.81-2.49)	2.82 (2.29-3.58)	665
Asians (2011 - 2012)	*	< LOD	1.46 (1.27-1.66)	2.23 (1.91-3.03)	3.03 (2.37-4.95)	341
Asians (2013 - 2014)	*	< LOD	1.77 (<LOD-2.18)	2.77 (2.23-3.53)	3.60 (2.69-5.70)	280

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Benzene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Benzene_FactSheet.html

Urinary N-Acetyl-S-(n-propyl)-L-cysteine (2005 – 2006)

CAS Number 4775-80-8

Metabolite of 1-Bromopropane

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	3.70 (3.40-4.02)	2.96 (2.62-3.41)	9.49 (8.61-10.6)	26.7 (22.1-33.3)	52.0 (42.7-62.5)	3346
Age 12-19 years (2005 - 2006)	3.57 (3.08-4.13)	2.89 (2.39-3.67)	9.29 (7.21-11.0)	24.5 (18.2-29.7)	46.1 (30.4-62.6)	1033
Age 20+ years (2005 - 2006)	3.72 (3.42-4.04)	2.97 (2.62-3.45)	9.58 (8.61-10.8)	27.3 (22.0-34.6)	52.6 (42.8-62.5)	2310
Males (2005 - 2006)	4.03 (3.63-4.47)	3.50 (2.97-4.06)	10.3 (8.76-11.9)	28.6 (21.7-35.0)	52.0 (42.0-62.5)	1589
Females (2005 - 2006)	3.40 (3.02-3.84)	2.57 (2.13-3.05)	8.98 (7.50-10.6)	26.0 (18.0-38.4)	49.3 (38.6-65.7)	1754
Mexican Americans (2005 - 2006)	5.63 (4.65-6.80)	5.61 (4.30-6.48)	17.0 (13.0-20.7)	44.8 (33.3-54.9)	77.2 (54.9-89.6)	819
Non-Hispanic blacks (2005 - 2006)	4.20 (3.57-4.95)	3.78 (2.89-5.26)	10.1 (8.96-12.4)	27.9 (19.8-37.9)	51.1 (37.9-77.7)	899
Non-Hispanic whites (2005 - 2006)	3.30 (3.05-3.58)	2.48 (2.17-2.87)	8.42 (7.50-9.45)	22.9 (18.6-29.5)	45.5 (33.3-56.9)	1367

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 1.2.

Urinary N-Acetyl-S-(n-propyl)-L-cysteine (2011 – 2014)

CAS Number 4775-80-8

Metabolite of 1-Bromopropane

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	4.08 (3.67-4.52)	3.70 (3.18-4.14)	10.3 (8.86-11.8)	26.5 (23.0-29.9)	43.7 (37.0-60.9)	2396
Total population (2013 - 2014)	3.27 (2.92-3.68)	2.68 (2.27-3.19)	7.56 (6.56-8.76)	20.6 (17.4-24.9)	37.1 (29.4-45.3)	2631
Age 6-11 years (2011 - 2012)	2.44 (2.15-2.78)	1.74 (1.44-2.30)	5.09 (4.38-6.26)	12.1 (8.91-20.7)	24.8 (15.7-32.0)	387
Age 6-11 years (2013 - 2014)	*	1.33 (<LOD-1.69)	4.16 (2.90-5.84)	10.2 (7.11-12.9)	17.2 (11.5-22.4)	398
Age 12-19 years (2011 - 2012)	3.13 (2.41-4.08)	2.46 (1.50-4.28)	7.10 (4.72-10.3)	18.1 (11.1-31.5)	31.6 (18.1-49.3)	366
Age 12-19 years (2013 - 2014)	2.94 (2.51-3.45)	2.58 (1.96-3.20)	6.75 (5.48-8.73)	15.0 (9.85-21.2)	23.3 (16.9-34.5)	445
Age 20+ years (2011 - 2012)	4.48 (4.00-5.02)	4.10 (3.64-4.63)	11.4 (9.69-13.8)	28.9 (24.6-33.1)	49.7 (36.1-72.4)	1643
Age 20+ years (2013 - 2014)	3.49 (3.09-3.95)	2.93 (2.42-3.45)	8.09 (6.90-9.58)	22.9 (19.4-28.7)	40.8 (32.3-50.3)	1788
Males (2011 - 2012)	4.27 (3.73-4.89)	3.75 (3.13-4.51)	10.4 (8.86-12.2)	28.4 (23.0-33.9)	48.9 (33.1-72.9)	1218
Males (2013 - 2014)	3.52 (3.05-4.06)	3.01 (2.57-3.53)	8.72 (7.25-10.0)	25.3 (17.2-31.1)	40.3 (30.1-50.9)	1306
Females (2011 - 2012)	3.90 (3.44-4.41)	3.58 (2.85-4.23)	10.2 (8.23-12.7)	24.8 (20.2-30.2)	43.0 (32.4-52.3)	1178
Females (2013 - 2014)	3.05 (2.66-3.50)	2.43 (1.95-3.06)	6.75 (5.79-7.88)	18.0 (15.2-21.2)	31.9 (23.5-41.0)	1325
Mexican Americans (2011 - 2012)	5.51 (4.37-6.95)	5.59 (4.13-8.24)	14.3 (11.1-20.8)	29.0 (22.3-40.5)	40.5 (28.2-60.8)	293
Mexican Americans (2013 - 2014)	3.65 (3.09-4.31)	2.97 (2.38-3.72)	9.90 (7.25-12.7)	24.1 (18.1-35.8)	38.0 (30.7-50.3)	450
Non-Hispanic blacks (2011 - 2012)	5.15 (4.24-6.27)	4.52 (3.51-5.67)	13.1 (10.3-16.4)	38.3 (27.3-52.2)	66.0 (43.0-93.2)	655
Non-Hispanic blacks (2013 - 2014)	3.99 (3.29-4.84)	3.49 (2.84-4.44)	8.87 (7.14-11.5)	28.5 (18.0-37.3)	40.2 (31.7-59.6)	569
Non-Hispanic whites (2011 - 2012)	3.52 (3.10-3.99)	3.09 (2.38-3.75)	8.33 (6.46-10.5)	21.7 (17.5-27.4)	39.6 (25.8-61.8)	795
Non-Hispanic whites (2013 - 2014)	2.99 (2.59-3.45)	2.41 (1.99-2.96)	6.75 (5.67-8.03)	17.2 (13.2-22.9)	29.9 (24.8-40.1)	973
All Hispanics (2011 - 2012)	5.18 (4.34-6.20)	5.16 (4.22-6.36)	12.9 (11.1-17.2)	28.9 (24.0-34.9)	43.5 (33.7-60.8)	544
All Hispanics (2013 - 2014)	3.46 (2.95-4.07)	2.82 (2.20-3.59)	8.73 (6.89-11.6)	24.1 (19.1-30.7)	36.9 (30.7-47.5)	698
Asians (2011 - 2012)	6.94 (5.71-8.45)	6.33 (4.70-9.11)	20.9 (16.9-27.0)	42.2 (32.8-58.0)	69.7 (48.9-98.7)	316
Asians (2013 - 2014)	4.92 (3.88-6.22)	3.99 (3.10-5.50)	12.4 (9.35-16.7)	42.1 (24.0-64.0)	71.3 (48.6-116)	287

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 1.2 and 1.2, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(n-propyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 4775-80-8

Metabolite of 1-Bromopropane

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	3.70 (3.40-4.03)	3.30 (2.89-3.71)	9.15 (7.73-10.1)	22.8 (18.3-28.7)	42.4 (34.7-53.1)	3333
Age 12-19 years (2005 - 2006)	2.73 (2.36-3.17)	2.29 (1.89-2.71)	6.15 (5.29-7.08)	17.8 (13.6-21.2)	33.1 (22.0-42.6)	1028
Age 20+ years (2005 - 2006)	3.89 (3.57-4.24)	3.46 (3.00-3.95)	9.50 (8.10-10.7)	24.2 (18.5-30.0)	43.9 (36.3-56.4)	2305
Males (2005 - 2006)	3.30 (2.98-3.66)	2.93 (2.56-3.48)	7.50 (6.63-9.68)	19.4 (16.7-25.8)	34.7 (29.8-44.9)	1583
Females (2005 - 2006)	4.14 (3.63-4.72)	3.67 (3.10-4.42)	9.70 (8.10-11.6)	25.7 (18.3-38.6)	48.0 (37.0-63.3)	1749
Mexican Americans (2005 - 2006)	5.05 (4.31-5.91)	4.54 (3.39-6.56)	14.8 (11.7-17.5)	36.4 (25.7-50.4)	59.4 (41.8-80.0)	816
Non-Hispanic blacks (2005 - 2006)	2.89 (2.44-3.44)	2.58 (2.05-3.47)	7.39 (5.66-8.81)	18.9 (14.4-22.1)	30.4 (25.1-39.2)	896
Non-Hispanic whites (2005 - 2006)	3.56 (3.29-3.85)	3.15 (2.70-3.51)	7.99 (7.12-9.32)	20.2 (17.6-27.2)	42.0 (32.2-52.6)	1365

Urinary N-Acetyl-S-(n-propyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 4775-80-8

Metabolite of 1-Bromopropane

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	4.64 (4.23-5.09)	4.19 (3.69-4.72)	11.3 (9.46-12.8)	28.8 (24.2-32.7)	46.1 (36.4-58.4)	2394
Total population (2013 - 2014)	3.80 (3.42-4.21)	3.44 (3.04-4.04)	8.67 (7.23-10.0)	21.6 (17.6-24.7)	35.2 (29.2-44.1)	2630
Age 6-11 years (2011 - 2012)	3.39 (3.01-3.82)	3.15 (2.58-3.87)	6.54 (5.46-7.71)	14.0 (10.7-17.1)	21.5 (14.5-30.0)	386
Age 6-11 years (2013 - 2014)	*	2.74 (<LOD-3.27)	5.67 (4.72-7.25)	12.1 (7.90-18.1)	21.8 (11.7-27.3)	398
Age 12-19 years (2011 - 2012)	3.08 (2.31-4.10)	2.59 (1.74-4.24)	7.14 (4.29-10.6)	15.6 (9.44-23.4)	23.8 (15.6-43.1)	366
Age 12-19 years (2013 - 2014)	2.68 (2.29-3.13)	2.67 (2.43-2.96)	5.91 (5.05-7.03)	11.4 (9.30-14.6)	18.6 (13.7-28.8)	445
Age 20+ years (2011 - 2012)	5.10 (4.61-5.64)	4.72 (4.17-5.32)	12.7 (11.1-13.9)	31.2 (25.1-40.0)	50.3 (37.9-64.4)	1642
Age 20+ years (2013 - 2014)	4.09 (3.65-4.58)	3.84 (3.29-4.43)	9.32 (7.90-11.2)	23.8 (19.5-29.5)	40.1 (31.6-52.9)	1787
Males (2011 - 2012)	4.01 (3.59-4.47)	3.59 (3.24-4.03)	9.20 (7.62-11.1)	24.6 (19.2-31.0)	40.0 (33.8-47.6)	1217
Males (2013 - 2014)	3.53 (3.10-4.02)	3.27 (2.67-4.00)	8.52 (6.94-9.55)	18.8 (16.6-24.6)	31.9 (24.6-42.1)	1305
Females (2011 - 2012)	5.34 (4.58-6.24)	4.88 (4.12-6.06)	12.9 (10.6-16.2)	30.3 (25.1-37.1)	50.3 (36.7-65.1)	1177
Females (2013 - 2014)	4.07 (3.57-4.65)	3.70 (3.10-4.25)	8.68 (7.05-11.2)	22.5 (18.1-30.4)	39.9 (28.8-56.4)	1325
Mexican Americans (2011 - 2012)	6.14 (5.18-7.29)	5.61 (3.86-8.70)	15.0 (12.5-21.8)	32.4 (22.7-45.2)	46.3 (27.4-67.1)	293
Mexican Americans (2013 - 2014)	4.18 (3.68-4.75)	3.48 (3.04-4.36)	10.3 (7.07-13.5)	22.3 (18.6-28.6)	38.7 (23.5-59.6)	450
Non-Hispanic blacks (2011 - 2012)	4.02 (3.29-4.91)	3.76 (2.94-4.71)	9.20 (6.72-12.9)	28.1 (17.7-45.7)	56.6 (33.4-72.3)	655
Non-Hispanic blacks (2013 - 2014)	3.05 (2.49-3.74)	2.74 (2.24-3.47)	6.91 (5.23-8.96)	16.1 (11.4-22.1)	28.8 (17.6-42.5)	569
Non-Hispanic whites (2011 - 2012)	4.30 (3.80-4.87)	3.83 (3.27-4.54)	9.88 (8.31-12.1)	25.6 (19.1-31.0)	42.2 (29.3-54.5)	793
Non-Hispanic whites (2013 - 2014)	3.70 (3.25-4.21)	3.44 (2.93-4.20)	8.29 (6.40-9.44)	19.0 (15.3-27.3)	32.6 (22.5-42.1)	972
All Hispanics (2011 - 2012)	5.76 (5.02-6.61)	5.44 (4.25-6.61)	13.8 (11.9-16.3)	30.9 (24.8-37.6)	45.8 (34.7-63.0)	544
All Hispanics (2013 - 2014)	3.87 (3.44-4.37)	3.30 (2.97-3.66)	9.34 (7.05-12.2)	22.3 (19.5-24.7)	36.4 (24.8-45.6)	698
Asians (2011 - 2012)	9.12 (7.40-11.2)	8.93 (7.06-11.8)	23.6 (16.6-36.7)	54.2 (43.1-65.0)	72.0 (60.4-107)	316
Asians (2013 - 2014)	7.76 (5.81-10.4)	7.08 (5.12-9.96)	18.2 (11.7-26.8)	53.3 (38.7-72.3)	96.7 (53.3-162)	287

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine (2005 – 2006)

CAS Number 144889-50-9

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	264 (240-289)	303 (281-325)	497 (456-532)	733 (672-807)	916 (824-1030)	3346
Age 12-19 years (2005 - 2006)	330 (294-370)	361 (318-397)	555 (501-610)	802 (749-858)	988 (868-1150)	1035
Age 20+ years (2005 - 2006)	255 (231-281)	295 (269-320)	482 (443-526)	717 (656-801)	910 (801-1050)	2310
Males (2005 - 2006)	310 (280-343)	354 (322-381)	544 (494-612)	807 (717-884)	1010 (854-1130)	1591
Females (2005 - 2006)	226 (205-249)	254 (233-281)	434 (409-461)	657 (602-703)	841 (716-968)	1755
Mexican Americans (2005 - 2006)	278 (250-308)	311 (285-341)	470 (422-537)	682 (589-756)	810 (735-887)	820
Non-Hispanic blacks (2005 - 2006)	327 (288-370)	367 (330-392)	544 (503-584)	786 (697-884)	998 (811-1240)	899
Non-Hispanic whites (2005 - 2006)	255 (227-286)	294 (268-323)	497 (451-539)	733 (657-827)	915 (801-1070)	1368

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 5.25.

Urinary N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine (2011 – 2014)

CAS Number 144889-50-9

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	262 (244-281)	281 (264-307)	470 (436-499)	673 (629-736)	877 (777-971)	2466
Total population (2013 - 2014)	246 (229-265)	270 (250-283)	458 (430-487)	710 (659-750)	865 (799-908)	2639
Age 6-11 years (2011 - 2012)	265 (236-297)	283 (248-346)	466 (416-512)	756 (552-914)	934 (604-1480)	394
Age 6-11 years (2013 - 2014)	244 (213-280)	256 (211-307)	434 (367-524)	757 (582-863)	918 (782-990)	398
Age 12-19 years (2011 - 2012)	266 (228-309)	283 (233-353)	524 (429-548)	674 (627-711)	754 (674-912)	384
Age 12-19 years (2013 - 2014)	282 (241-331)	305 (264-351)	525 (424-587)	747 (661-844)	946 (747-1230)	449
Age 20+ years (2011 - 2012)	261 (241-283)	281 (256-310)	466 (427-498)	670 (618-768)	877 (777-976)	1688
Age 20+ years (2013 - 2014)	242 (223-261)	267 (244-280)	453 (427-472)	701 (645-738)	837 (782-901)	1792
Males (2011 - 2012)	310 (284-339)	340 (299-382)	505 (475-547)	721 (645-837)	958 (797-1220)	1251
Males (2013 - 2014)	270 (243-301)	288 (261-328)	483 (439-533)	725 (658-781)	877 (768-943)	1310
Females (2011 - 2012)	223 (204-243)	233 (215-258)	422 (384-442)	625 (574-658)	803 (661-909)	1215
Females (2013 - 2014)	225 (210-242)	244 (220-266)	421 (395-456)	696 (641-747)	844 (794-898)	1329
Mexican Americans (2011 - 2012)	258 (221-301)	285 (228-346)	458 (401-489)	591 (520-718)	755 (613-911)	313
Mexican Americans (2013 - 2014)	254 (230-282)	276 (234-315)	426 (392-484)	669 (570-761)	808 (718-953)	451
Non-Hispanic blacks (2011 - 2012)	328 (302-356)	369 (320-399)	536 (496-583)	777 (689-848)	947 (872-1060)	662
Non-Hispanic blacks (2013 - 2014)	337 (310-366)	365 (337-384)	544 (501-617)	761 (703-878)	938 (814-1120)	572
Non-Hispanic whites (2011 - 2012)	259 (238-281)	275 (240-303)	470 (424-520)	688 (628-771)	906 (746-1030)	810
Non-Hispanic whites (2013 - 2014)	238 (212-268)	255 (222-282)	459 (411-518)	725 (651-790)	876 (790-936)	975
All Hispanics (2011 - 2012)	253 (220-290)	277 (238-329)	453 (398-493)	582 (521-671)	740 (618-841)	566
All Hispanics (2013 - 2014)	250 (230-273)	272 (236-302)	421 (393-462)	655 (560-738)	799 (718-871)	699
Asians (2011 - 2012)	193 (171-218)	220 (193-247)	340 (299-407)	498 (440-566)	623 (537-751)	341
Asians (2013 - 2014)	167 (145-192)	182 (137-227)	311 (287-338)	435 (376-497)	542 (454-708)	289

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 5.25 and 5.25, respectively.

Urinary N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 144889-50-9

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	264 (241-289)	274 (256-294)	363 (339-388)	482 (439-523)	575 (533-634)	3334
Age 12-19 years (2005 - 2006)	253 (236-271)	252 (238-270)	329 (303-357)	425 (390-468)	515 (463-571)	1028
Age 20+ years (2005 - 2006)	266 (241-293)	278 (260-301)	368 (346-392)	493 (443-535)	585 (537-666)	2305
Males (2005 - 2006)	254 (230-280)	264 (241-291)	354 (327-378)	443 (408-508)	540 (483-634)	1585
Females (2005 - 2006)	275 (251-300)	282 (266-300)	375 (347-406)	506 (463-544)	594 (562-645)	1748
Mexican Americans (2005 - 2006)	249 (234-265)	253 (234-269)	330 (314-340)	417 (402-438)	515 (463-543)	816
Non-Hispanic blacks (2005 - 2006)	225 (198-256)	227 (206-253)	317 (289-340)	436 (377-498)	539 (452-652)	897
Non-Hispanic whites (2005 - 2006)	275 (249-304)	287 (264-315)	377 (354-403)	506 (454-543)	586 (540-677)	1364

Urinary N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 144889-50-9

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	299 (285-314)	293 (282-308)	388 (373-404)	504 (476-539)	603 (567-645)	2464
Total population (2013 - 2014)	285 (264-308)	288 (267-313)	390 (371-415)	512 (481-559)	624 (571-694)	2638
Age 6-11 years (2011 - 2012)	380 (354-408)	379 (346-401)	478 (448-528)	644 (581-674)	755 (651-773)	393
Age 6-11 years (2013 - 2014)	366 (332-405)	372 (335-418)	476 (447-545)	622 (567-698)	715 (622-931)	398
Age 12-19 years (2011 - 2012)	259 (241-278)	260 (246-270)	314 (284-353)	406 (359-430)	433 (407-480)	384
Age 12-19 years (2013 - 2014)	256 (242-271)	251 (234-265)	343 (318-355)	451 (401-510)	522 (451-664)	449
Age 20+ years (2011 - 2012)	298 (283-313)	292 (280-309)	384 (370-404)	502 (472-539)	583 (560-645)	1687
Age 20+ years (2013 - 2014)	283 (260-307)	286 (264-314)	387 (364-412)	507 (475-556)	617 (555-696)	1791
Males (2011 - 2012)	291 (276-307)	286 (272-295)	382 (363-405)	493 (462-528)	579 (527-675)	1250
Males (2013 - 2014)	271 (248-296)	273 (246-305)	367 (343-391)	486 (456-534)	600 (534-667)	1309
Females (2011 - 2012)	307 (290-326)	304 (285-320)	392 (370-421)	524 (491-549)	608 (567-645)	1214
Females (2013 - 2014)	300 (277-325)	304 (286-328)	413 (388-435)	537 (497-587)	661 (585-771)	1329
Mexican Americans (2011 - 2012)	291 (245-345)	291 (251-340)	378 (338-423)	490 (416-575)	575 (492-647)	313
Mexican Americans (2013 - 2014)	291 (271-314)	290 (263-327)	374 (350-411)	502 (454-535)	601 (493-924)	451
Non-Hispanic blacks (2011 - 2012)	256 (240-272)	246 (234-261)	327 (303-350)	438 (390-478)	520 (470-571)	662
Non-Hispanic blacks (2013 - 2014)	257 (243-272)	259 (244-280)	346 (333-365)	469 (435-511)	558 (507-605)	572
Non-Hispanic whites (2011 - 2012)	316 (300-333)	311 (295-324)	408 (392-431)	534 (493-573)	645 (572-681)	808
Non-Hispanic whites (2013 - 2014)	295 (268-324)	297 (277-325)	411 (382-441)	537 (489-595)	655 (585-732)	974
All Hispanics (2011 - 2012)	283 (254-316)	280 (253-310)	367 (342-395)	472 (430-504)	540 (477-603)	566
All Hispanics (2013 - 2014)	280 (260-301)	279 (258-309)	370 (354-387)	483 (450-523)	585 (492-782)	699
Asians (2011 - 2012)	258 (243-275)	252 (234-272)	330 (309-355)	413 (380-462)	524 (425-583)	341
Asians (2013 - 2014)	264 (235-296)	267 (237-299)	339 (311-371)	468 (364-584)	577 (437-1080)	289

Urinary N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine (2005 – 2006)

CAS Number 144889-50-9

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2313
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	902
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 0.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine (2011 – 2014)

CAS Number 144889-50-9

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2466
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2587
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	394
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	389
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	438
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1688
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1760
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1251
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1283
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1215
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1304
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	446
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	559
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	952
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	692
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	286

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.7 and 0.7, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 144889-50-9

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2312
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 144889-50-9

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2464
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2586
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	389
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	438
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1687
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1759
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1250
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1282
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1214
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1304
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	446
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	559
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	951
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	692
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	286

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine (2005 – 2006)

CAS Number 159092-64-5

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	1.60 (1.10-2.24)	3.21 (2.73-3.85)	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.22 (<LOD-1.91)	1035
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	1.78 (1.33-2.39)	3.56 (2.97-4.10)	2313
Males (2005 - 2006)	*	< LOD	< LOD	1.80 (1.49-2.44)	3.37 (2.64-4.06)	1592
Females (2005 - 2006)	*	< LOD	< LOD	1.18 (<LOD-1.86)	3.14 (2.52-3.65)	1756
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	1.06 (<LOD-2.05)	821
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	1.34 (.851-1.75)	2.90 (1.74-4.42)	902
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	1.86 (1.33-2.70)	3.67 (2.99-4.24)	1370

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 0.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine (2011 – 2014)

CAS Number 159092-64-5

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	.985 (<LOD-1.33)	2.53 (2.03-3.34)	2466
Total population (2013 - 2014)	*	< LOD	< LOD	.906 (<LOD-1.25)	2.29 (1.85-2.72)	2627
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	394
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	395
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	1.51 (.882-2.12)	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	1.13 (<LOD-2.41)	449
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	1.21 (.931-1.88)	3.23 (2.20-4.26)	1688
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	1.19 (.793-1.50)	2.54 (2.03-3.32)	1783
Males (2011 - 2012)	*	< LOD	< LOD	.931 (<LOD-1.25)	2.21 (1.33-3.23)	1251
Males (2013 - 2014)	*	< LOD	< LOD	.712 (<LOD-.960)	1.94 (1.50-2.23)	1304
Females (2011 - 2012)	*	< LOD	< LOD	1.07 (<LOD-1.76)	2.90 (2.20-3.79)	1215
Females (2013 - 2014)	*	< LOD	< LOD	1.17 (<LOD-1.76)	2.69 (1.68-4.43)	1323
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	.785 (<LOD-1.24)	1.25 (.785-3.39)	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	.730 (<LOD-1.91)	448
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	.855 (<LOD-1.23)	2.71 (1.32-4.34)	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	1.31 (.802-2.06)	3.32 (2.06-5.10)	570
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	1.16 (.714-1.76)	2.90 (2.11-4.26)	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	1.11 (<LOD-1.60)	2.57 (1.68-3.47)	970
All Hispanics (2011 - 2012)	*	< LOD	< LOD	.711 (<LOD-1.23)	1.45 (.914-2.97)	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	1.28 (<LOD-1.98)	696
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	289

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.7 and 0.7, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 159092-64-5

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	2.27 (2.02-2.61)	3.54 (3.05-3.85)	3347
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.60 (<LOD-2.25)	1035
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	2.48 (2.19-2.77)	3.76 (3.26-4.09)	2311
Males (2005 - 2006)	*	< LOD	< LOD	1.94 (1.55-2.25)	2.91 (2.32-3.80)	1592
Females (2005 - 2006)	*	< LOD	< LOD	2.61 (<LOD-2.98)	3.81 (3.30-4.13)	1755
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	1.79 (<LOD-2.15)	821
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	1.17 (.990-1.50)	2.24 (1.71-2.83)	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	2.61 (2.25-2.91)	3.81 (3.26-4.40)	1370

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 159092-64-5

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	2.15 (<LOD-2.65)	3.70 (2.75-5.20)	2464
Total population (2013 - 2014)	*	< LOD	< LOD	2.15 (<LOD-2.36)	3.31 (2.75-3.81)	2626
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	395
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	2.61 (1.65-3.09)	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	1.77 (<LOD-2.75)	449
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	2.32 (1.98-2.86)	4.27 (2.91-5.68)	1687
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	2.25 (2.03-2.61)	3.54 (2.91-4.30)	1782
Males (2011 - 2012)	*	< LOD	< LOD	1.71 (<LOD-2.06)	2.91 (2.12-3.51)	1250
Males (2013 - 2014)	*	< LOD	< LOD	1.69 (<LOD-1.98)	2.55 (1.83-3.54)	1303
Females (2011 - 2012)	*	< LOD	< LOD	2.65 (<LOD-3.30)	4.67 (3.06-6.21)	1214
Females (2013 - 2014)	*	< LOD	< LOD	2.61 (<LOD-2.91)	3.75 (2.91-4.50)	1323
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	1.71 (<LOD-2.32)	2.32 (1.71-4.76)	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	1.98 (<LOD-2.36)	448
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	1.44 (<LOD-1.57)	2.06 (1.65-2.70)	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	1.45 (1.20-1.83)	2.39 (1.83-3.06)	570
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	2.48 (1.98-2.91)	4.48 (2.91-5.67)	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	2.48 (<LOD-2.91)	3.63 (2.91-4.50)	969
All Hispanics (2011 - 2012)	*	< LOD	< LOD	1.98 (<LOD-2.32)	2.61 (2.15-3.30)	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	2.15 (<LOD-3.54)	696
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	289

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine (2005 – 2006)

CAS Number 159092-65-6

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	6.22 (5.55-6.98)	5.78 (5.24-6.55)	14.3 (11.7-16.2)	40.4 (33.1-48.4)	69.3 (59.1-77.6)	3347
Age 12-19 years (2005 - 2006)	6.15 (5.09-7.44)	6.34 (5.01-7.92)	11.4 (10.4-13.3)	21.9 (18.6-26.0)	39.9 (25.5-57.8)	1029
Age 20+ years (2005 - 2006)	6.24 (5.53-7.04)	5.66 (5.17-6.39)	14.9 (11.6-18.2)	43.6 (35.2-53.3)	71.8 (62.0-80.1)	2312
Males (2005 - 2006)	7.72 (6.92-8.61)	7.28 (6.38-8.19)	15.9 (13.4-19.8)	46.1 (35.2-59.1)	70.7 (61.1-79.2)	1587
Females (2005 - 2006)	5.07 (4.42-5.81)	4.65 (4.20-5.21)	11.4 (8.91-14.5)	34.2 (26.0-43.2)	66.2 (48.1-84.0)	1750
Mexican Americans (2005 - 2006)	5.80 (5.29-6.37)	5.58 (4.96-6.27)	11.2 (9.76-12.9)	21.1 (18.6-25.3)	32.9 (25.3-39.9)	820
Non-Hispanic blacks (2005 - 2006)	8.37 (7.28-9.62)	6.97 (6.13-8.27)	17.1 (14.2-22.2)	52.5 (35.2-66.1)	76.1 (59.5-89.3)	899
Non-Hispanic whites (2005 - 2006)	6.10 (5.24-7.09)	5.66 (4.88-6.84)	14.9 (11.2-18.6)	43.3 (32.8-56.0)	71.8 (59.4-80.2)	1369

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 0.6.

Urinary N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine (2011 – 2014)

CAS Number 159092-65-6

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	5.64 (5.12-6.21)	5.30 (4.89-5.80)	10.6 (9.41-12.2)	28.2 (24.5-32.1)	57.6 (44.2-68.1)	2466
Total population (2013 - 2014)	5.81 (5.29-6.38)	5.18 (4.79-5.69)	10.9 (9.77-12.2)	28.1 (24.4-32.5)	53.5 (46.5-56.6)	2520
Age 6-11 years (2011 - 2012)	4.58 (4.16-5.04)	4.77 (4.07-5.49)	8.91 (7.39-10.4)	14.8 (11.1-19.3)	19.3 (14.6-22.8)	394
Age 6-11 years (2013 - 2014)	4.61 (3.86-5.49)	4.86 (3.63-6.52)	8.86 (7.84-10.3)	15.6 (12.9-18.9)	19.4 (15.6-29.1)	380
Age 12-19 years (2011 - 2012)	4.49 (3.59-5.61)	5.18 (3.54-6.67)	9.16 (7.79-10.2)	15.9 (11.3-25.7)	25.7 (14.1-51.1)	384
Age 12-19 years (2013 - 2014)	5.32 (4.58-6.19)	5.28 (4.59-5.95)	10.2 (7.74-12.1)	16.3 (13.3-23.0)	24.9 (16.3-55.7)	437
Age 20+ years (2011 - 2012)	5.97 (5.40-6.61)	5.43 (4.92-6.00)	11.5 (9.82-13.5)	34.3 (28.2-42.3)	61.7 (55.7-72.7)	1688
Age 20+ years (2013 - 2014)	6.03 (5.42-6.70)	5.19 (4.72-5.83)	11.5 (10.0-13.9)	33.4 (28.3-40.7)	55.2 (50.6-61.7)	1703
Males (2011 - 2012)	6.69 (6.18-7.26)	6.21 (5.80-6.87)	11.3 (10.1-13.5)	28.5 (23.6-37.1)	58.0 (38.5-74.9)	1251
Males (2013 - 2014)	6.25 (5.75-6.79)	5.73 (5.17-6.27)	11.3 (10.2-12.2)	26.8 (23.4-32.0)	53.5 (45.5-57.6)	1260
Females (2011 - 2012)	4.78 (4.06-5.63)	4.24 (3.68-4.92)	9.56 (8.20-11.8)	28.2 (20.5-40.0)	57.1 (40.7-69.9)	1215
Females (2013 - 2014)	5.40 (4.69-6.22)	4.71 (4.12-5.36)	10.7 (8.25-13.5)	31.3 (23.7-37.5)	53.3 (42.6-61.3)	1260
Mexican Americans (2011 - 2012)	5.12 (4.07-6.44)	5.36 (4.37-6.46)	10.2 (8.60-13.4)	20.5 (16.8-24.1)	24.7 (18.5-60.8)	313
Mexican Americans (2013 - 2014)	5.11 (4.54-5.75)	4.76 (4.24-5.18)	9.11 (7.79-11.0)	16.9 (12.6-24.1)	25.0 (18.3-40.2)	425
Non-Hispanic blacks (2011 - 2012)	7.22 (6.50-8.03)	6.93 (6.31-7.54)	13.5 (12.2-15.0)	31.7 (23.7-37.7)	58.5 (40.4-73.1)	662
Non-Hispanic blacks (2013 - 2014)	8.59 (7.59-9.71)	7.50 (6.77-8.63)	17.3 (12.9-21.6)	46.2 (33.3-55.2)	69.2 (54.3-77.2)	556
Non-Hispanic whites (2011 - 2012)	5.57 (4.88-6.36)	5.03 (4.41-5.85)	10.6 (8.66-12.8)	31.4 (25.6-42.3)	58.5 (44.5-69.0)	810
Non-Hispanic whites (2013 - 2014)	5.74 (5.02-6.56)	4.99 (4.51-5.80)	10.9 (9.00-13.4)	31.5 (23.3-40.7)	55.7 (47.6-63.5)	929
All Hispanics (2011 - 2012)	5.07 (4.29-6.01)	5.10 (4.46-5.80)	9.82 (8.81-11.5)	20.6 (16.8-24.4)	30.2 (23.2-46.3)	566
All Hispanics (2013 - 2014)	5.14 (4.57-5.78)	4.79 (4.38-5.17)	9.64 (8.00-11.3)	19.0 (13.6-24.9)	27.5 (24.1-37.1)	661
Asians (2011 - 2012)	4.34 (3.83-4.92)	4.62 (3.96-5.13)	8.20 (7.13-9.51)	13.7 (11.6-19.8)	29.9 (16.1-50.6)	341
Asians (2013 - 2014)	4.06 (3.42-4.81)	4.02 (3.33-4.53)	7.18 (5.80-8.60)	13.9 (10.1-19.9)	25.0 (13.5-59.9)	272

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.6 and 0.6, respectively.

Urinary N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 159092-65-6

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	6.24 (5.62-6.92)	5.07 (4.61-5.58)	10.6 (9.15-12.8)	34.1 (28.0-42.8)	59.0 (50.4-66.6)	3330
Age 12-19 years (2005 - 2006)	4.71 (4.13-5.37)	4.12 (3.59-4.99)	7.40 (6.43-8.81)	13.8 (11.3-17.2)	21.1 (14.7-29.6)	1027
Age 20+ years (2005 - 2006)	6.52 (5.82-7.30)	5.21 (4.75-5.71)	11.5 (9.42-15.0)	38.0 (30.0-48.4)	61.5 (51.6-71.2)	2303
Males (2005 - 2006)	6.32 (5.62-7.11)	5.09 (4.56-5.65)	11.1 (9.06-15.4)	33.0 (26.6-42.5)	51.0 (45.3-59.9)	1583
Females (2005 - 2006)	6.16 (5.51-6.89)	5.04 (4.53-5.68)	10.1 (8.91-12.0)	36.4 (28.1-46.6)	66.0 (54.3-71.5)	1747
Mexican Americans (2005 - 2006)	5.21 (4.80-5.65)	4.61 (4.36-4.93)	8.31 (7.69-9.33)	14.7 (12.9-16.9)	19.9 (16.6-30.1)	816
Non-Hispanic blacks (2005 - 2006)	5.77 (5.06-6.57)	4.82 (4.17-5.40)	11.3 (9.34-14.2)	29.1 (23.2-35.6)	45.1 (34.1-59.9)	896
Non-Hispanic whites (2005 - 2006)	6.58 (5.71-7.58)	5.27 (4.67-5.90)	11.4 (9.15-16.0)	38.2 (28.5-50.4)	65.1 (51.0-72.9)	1364

Urinary N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 159092-65-6

Metabolite of 1,3-Butadiene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	6.44 (5.91-7.02)	5.36 (4.88-5.82)	9.69 (8.71-11.0)	29.9 (25.3-36.2)	52.8 (37.4-73.3)	2464
Total population (2013 - 2014)	6.54 (5.85-7.31)	5.46 (4.89-6.16)	10.4 (9.33-11.8)	29.6 (24.0-34.1)	49.6 (43.0-60.0)	2519
Age 6-11 years (2011 - 2012)	6.55 (6.05-7.09)	6.46 (5.94-7.00)	9.10 (8.17-10.3)	13.8 (11.2-17.7)	17.7 (13.4-24.5)	393
Age 6-11 years (2013 - 2014)	6.71 (5.72-7.88)	7.09 (5.97-8.11)	10.3 (9.05-11.0)	14.9 (12.2-18.9)	23.0 (14.9-27.9)	380
Age 12-19 years (2011 - 2012)	4.37 (3.77-5.07)	4.36 (3.57-4.92)	6.27 (5.68-7.64)	11.4 (8.24-17.1)	19.3 (10.9-31.0)	384
Age 12-19 years (2013 - 2014)	4.73 (4.17-5.37)	4.31 (3.64-5.08)	6.70 (5.62-7.48)	11.4 (9.66-16.1)	30.8 (12.7-54.1)	437
Age 20+ years (2011 - 2012)	6.82 (6.25-7.44)	5.39 (4.85-6.07)	10.7 (9.51-12.2)	37.1 (29.9-43.3)	64.8 (44.1-84.1)	1687
Age 20+ years (2013 - 2014)	6.85 (6.09-7.70)	5.53 (4.96-6.29)	11.2 (9.71-13.9)	33.3 (27.7-42.0)	54.5 (46.0-66.4)	1702
Males (2011 - 2012)	6.29 (5.83-6.79)	5.38 (4.85-5.83)	9.83 (8.50-11.6)	27.0 (20.4-34.4)	41.9 (37.4-52.1)	1250
Males (2013 - 2014)	6.11 (5.55-6.73)	5.39 (4.79-5.90)	9.94 (8.91-10.7)	25.2 (18.5-29.8)	43.0 (31.6-50.6)	1259
Females (2011 - 2012)	6.59 (5.69-7.64)	5.35 (4.68-6.17)	9.49 (7.93-12.9)	31.5 (19.7-49.2)	68.8 (44.1-89.0)	1214
Females (2013 - 2014)	6.98 (5.97-8.16)	5.68 (4.81-6.61)	10.6 (9.08-14.5)	34.2 (24.5-47.5)	60.7 (45.3-81.8)	1260
Mexican Americans (2011 - 2012)	5.78 (4.56-7.33)	5.39 (4.72-6.18)	9.51 (7.91-10.9)	17.4 (12.3-28.3)	29.9 (17.1-58.1)	313
Mexican Americans (2013 - 2014)	5.63 (4.95-6.41)	5.20 (4.37-6.07)	8.55 (7.60-9.94)	15.4 (12.0-18.1)	31.2 (15.8-50.9)	425
Non-Hispanic blacks (2011 - 2012)	5.63 (5.23-6.07)	4.86 (4.35-5.38)	9.45 (8.29-10.7)	21.9 (17.2-24.3)	34.2 (24.8-40.1)	662
Non-Hispanic blacks (2013 - 2014)	6.40 (5.57-7.37)	4.93 (4.31-5.65)	12.5 (10.4-16.0)	28.5 (24.7-33.2)	41.0 (32.3-50.6)	556
Non-Hispanic whites (2011 - 2012)	6.81 (6.10-7.61)	5.42 (4.78-6.15)	10.1 (8.68-12.0)	37.2 (27.0-45.2)	68.5 (43.3-89.0)	808
Non-Hispanic whites (2013 - 2014)	6.91 (6.03-7.91)	5.61 (4.95-6.49)	10.5 (8.99-13.4)	33.5 (25.4-45.3)	55.4 (45.4-69.3)	928
All Hispanics (2011 - 2012)	5.68 (4.93-6.54)	5.22 (4.72-5.79)	8.78 (7.84-9.81)	18.3 (12.9-25.8)	30.9 (20.2-44.7)	566
All Hispanics (2013 - 2014)	5.53 (4.80-6.36)	5.01 (4.36-5.82)	8.75 (7.39-10.4)	15.6 (12.7-18.9)	31.3 (17.7-49.7)	661
Asians (2011 - 2012)	5.81 (5.41-6.25)	5.25 (4.89-5.64)	8.53 (7.50-9.29)	17.7 (12.1-23.0)	28.2 (22.1-44.2)	341
Asians (2013 - 2014)	6.18 (5.28-7.24)	5.79 (4.98-7.09)	10.4 (8.28-11.8)	17.4 (13.8-25.6)	27.0 (16.1-47.8)	272

Urinary 2-Thioxothiazolidine-4-carboxylic acid (2005 – 2006)

CAS Number 20933-67-9

Metabolite of Carbon disulfide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	19.3 (17.3-22.0)	52.8 (43.5-65.0)	103 (84.2-126)	3348
Age 12-19 years (2005 - 2006)	*	< LOD	16.4 (13.6-20.5)	50.2 (34.1-68.8)	111 (65.6-143)	1035
Age 20+ years (2005 - 2006)	*	< LOD	20.0 (18.1-22.6)	53.0 (43.5-65.3)	102 (84.2-126)	2312
Males (2005 - 2006)	*	< LOD	23.0 (18.8-27.4)	58.9 (46.0-72.9)	127 (96.8-162)	1590
Females (2005 - 2006)	*	< LOD	16.6 (13.6-19.7)	45.7 (37.6-59.6)	85.1 (68.8-108)	1757
Mexican Americans (2005 - 2006)	*	< LOD	16.9 (12.2-22.0)	50.6 (29.1-65.2)	73.7 (54.0-114)	821
Non-Hispanic blacks (2005 - 2006)	*	12.7 (<LOD-14.7)	33.7 (27.9-36.7)	77.4 (66.4-99.0)	146 (99.0-264)	902
Non-Hispanic whites (2005 - 2006)	*	< LOD	17.7 (14.6-20.4)	46.2 (37.6-60.7)	96.8 (69.4-124)	1370

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 11.2.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Thioxothiazolidine-4-carboxylic acid (2011 – 2014)

CAS Number 20933-67-9

Metabolite of Carbon disulfide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	17.7 (14.3-22.2)	51.7 (39.1-64.5)	109 (73.9-145)	2466
Total population (2013 - 2014)	*	< LOD	18.4 (17.2-19.3)	51.7 (45.2-60.3)	119 (93.9-132)	2640
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	37.0 (24.2-50.7)	58.5 (41.2-89.7)	394
Age 6-11 years (2013 - 2014)	*	< LOD	13.3 (<LOD-17.4)	30.8 (21.8-46.9)	64.5 (30.8-139)	398
Age 12-19 years (2011 - 2012)	*	< LOD	13.2 (<LOD-21.1)	39.0 (21.4-63.5)	91.5 (39.0-138)	384
Age 12-19 years (2013 - 2014)	*	< LOD	13.8 (<LOD-18.1)	40.9 (22.8-59.3)	82.0 (45.5-122)	449
Age 20+ years (2011 - 2012)	*	< LOD	19.5 (14.9-25.1)	56.7 (42.4-69.6)	118 (91.1-147)	1688
Age 20+ years (2013 - 2014)	*	< LOD	19.3 (17.9-22.0)	57.3 (47.0-73.0)	125 (97.3-152)	1793
Males (2011 - 2012)	*	< LOD	23.2 (17.0-28.8)	62.5 (46.7-96.0)	123 (99.6-157)	1251
Males (2013 - 2014)	*	< LOD	20.3 (17.9-22.5)	56.3 (40.3-88.4)	127 (88.4-176)	1311
Females (2011 - 2012)	*	< LOD	13.9 (<LOD-18.1)	36.7 (28.1-52.9)	73.9 (49.8-134)	1215
Females (2013 - 2014)	*	< LOD	16.5 (14.8-18.2)	47.6 (39.9-60.3)	105 (82.9-128)	1329
Mexican Americans (2011 - 2012)	*	< LOD	15.7 (<LOD-22.6)	42.6 (32.6-59.3)	65.4 (52.3-104)	313
Mexican Americans (2013 - 2014)	*	< LOD	12.3 (<LOD-19.6)	36.8 (23.1-52.6)	81.7 (48.9-105)	451
Non-Hispanic blacks (2011 - 2012)	*	< LOD	25.6 (21.1-29.6)	63.1 (51.3-75.0)	125 (75.0-177)	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	22.5 (18.0-28.8)	76.9 (47.0-97.6)	130 (99.6-172)	572
Non-Hispanic whites (2011 - 2012)	*	< LOD	16.0 (11.6-23.4)	46.7 (34.1-70.0)	111 (65.7-159)	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	18.7 (16.7-20.9)	49.9 (40.9-63.6)	121 (73.9-153)	976
All Hispanics (2011 - 2012)	*	< LOD	13.6 (<LOD-19.1)	38.9 (29.8-55.1)	65.4 (55.1-92.5)	566
All Hispanics (2013 - 2014)	*	< LOD	12.9 (<LOD-18.4)	39.1 (28.0-52.6)	93.4 (59.8-106)	699
Asians (2011 - 2012)	*	< LOD	31.1 (20.6-45.6)	121 (68.0-180)	225 (130-558)	341
Asians (2013 - 2014)	*	< LOD	23.7 (15.5-35.6)	79.2 (48.1-130)	227 (73.7-578)	289

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 11.2 and 11.2, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Thioxothiazolidine-4-carboxylic acid (creatinine corrected) (2005 – 2006)

CAS Number 20933-67-9

Metabolite of Carbon disulfide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	23.3 (21.4-26.3)	49.5 (45.0-56.6)	92.8 (73.1-115)	3347
Age 12-19 years (2005 - 2006)	*	< LOD	15.8 (14.1-18.9)	35.3 (28.8-49.4)	66.8 (49.5-104)	1034
Age 20+ years (2005 - 2006)	*	< LOD	24.8 (22.0-28.1)	52.2 (46.0-60.1)	93.0 (75.8-117)	2312
Males (2005 - 2006)	*	< LOD	20.8 (17.5-24.0)	45.0 (36.7-56.4)	89.5 (60.9-116)	1590
Females (2005 - 2006)	*	< LOD	26.4 (22.7-30.5)	54.9 (46.6-62.1)	92.8 (72.0-136)	1756
Mexican Americans (2005 - 2006)	*	< LOD	20.1 (16.9-23.5)	41.1 (34.4-52.8)	69.9 (52.8-83.8)	820
Non-Hispanic blacks (2005 - 2006)	*	10.2 (<LOD-11.3)	21.6 (18.8-27.3)	55.7 (41.4-76.9)	102 (71.5-147)	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	24.0 (21.4-26.9)	48.2 (42.6-57.5)	88.5 (73.1-104)	1370

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Thioxothiazolidine-4-carboxylic acid (creatinine corrected) (2011 – 2014)

CAS Number 20933-67-9

Metabolite of Carbon disulfide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	26.8 (23.9-29.3)	58.0 (49.6-71.8)	107 (93.8-136)	2464
Total population (2013 - 2014)	*	< LOD	27.7 (25.4-30.2)	64.4 (56.4-71.3)	113 (93.8-134)	2639
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	50.2 (41.6-60.8)	87.8 (56.4-123)	393
Age 6-11 years (2013 - 2014)	*	< LOD	28.2 (<LOD-41.5)	52.7 (45.7-74.0)	82.7 (59.4-203)	398
Age 12-19 years (2011 - 2012)	*	< LOD	20.8 (<LOD-27.6)	37.9 (29.3-66.7)	87.8 (31.6-113)	384
Age 12-19 years (2013 - 2014)	*	< LOD	17.6 (<LOD-22.6)	33.3 (28.2-40.6)	53.3 (38.6-87.8)	449
Age 20+ years (2011 - 2012)	*	< LOD	27.5 (24.9-29.8)	62.3 (51.4-79.1)	134 (86.0-176)	1687
Age 20+ years (2013 - 2014)	*	< LOD	29.3 (27.2-31.6)	68.5 (60.8-76.2)	129 (99.3-158)	1792
Males (2011 - 2012)	*	< LOD	23.2 (21.0-27.2)	53.5 (44.6-68.0)	110 (75.8-147)	1250
Males (2013 - 2014)	*	< LOD	24.7 (21.9-27.2)	60.6 (46.5-74.1)	93.8 (74.9-137)	1310
Females (2011 - 2012)	*	< LOD	29.3 (<LOD-31.6)	61.7 (44.0-87.8)	106 (87.8-142)	1214
Females (2013 - 2014)	*	< LOD	30.1 (27.2-34.9)	68.0 (52.7-78.3)	134 (100-171)	1329
Mexican Americans (2011 - 2012)	*	< LOD	23.1 (<LOD-28.6)	41.6 (29.4-58.4)	61.1 (37.0-198)	313
Mexican Americans (2013 - 2014)	*	< LOD	22.6 (<LOD-24.7)	38.7 (30.4-56.3)	69.5 (44.1-115)	451
Non-Hispanic blacks (2011 - 2012)	*	< LOD	21.4 (18.0-24.7)	55.5 (44.2-66.0)	103 (71.8-135)	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	20.1 (17.6-23.7)	59.5 (37.7-80.0)	110 (80.3-151)	572
Non-Hispanic whites (2011 - 2012)	*	< LOD	27.2 (23.9-30.4)	60.8 (46.5-81.0)	110 (81.0-153)	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	28.8 (27.2-31.8)	68.0 (56.4-75.7)	122 (87.8-158)	975
All Hispanics (2011 - 2012)	*	< LOD	23.2 (<LOD-29.4)	44.2 (34.0-56.3)	62.4 (49.2-156)	566
All Hispanics (2013 - 2014)	*	< LOD	22.6 (<LOD-24.7)	43.6 (35.3-56.4)	77.2 (52.7-122)	699
Asians (2011 - 2012)	*	< LOD	44.7 (35.9-62.7)	128 (79.0-198)	227 (142-421)	341
Asians (2013 - 2014)	*	< LOD	41.6 (35.9-55.9)	117 (69.6-191)	257 (118-702)	289

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine (2005 – 2006)

CAS Number 33164-70-4

Metabolite of Crotonaldehyde

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	425 (386-467)	406 (376-433)	800 (707-967)	2210 (1760-2530)	3560 (3230-3760)	3347
Age 12-19 years (2005 - 2006)	381 (336-433)	394 (349-434)	637 (581-688)	1020 (795-1200)	1650 (1110-2460)	1032
Age 20+ years (2005 - 2006)	432 (389-480)	410 (368-444)	848 (734-1040)	2370 (1950-2930)	3660 (3480-4120)	2310
Males (2005 - 2006)	505 (453-562)	476 (433-537)	947 (760-1110)	2450 (1980-3000)	3630 (3360-4120)	1590
Females (2005 - 2006)	360 (328-395)	340 (325-355)	701 (625-800)	1790 (1600-2210)	3230 (2570-3900)	1755
Mexican Americans (2005 - 2006)	382 (342-427)	391 (348-423)	650 (553-756)	1230 (1010-1550)	1970 (1710-2240)	820
Non-Hispanic blacks (2005 - 2006)	516 (452-589)	444 (406-493)	920 (722-1280)	2490 (1950-3040)	3660 (3140-4220)	901
Non-Hispanic whites (2005 - 2006)	424 (372-483)	404 (356-448)	838 (708-1050)	2360 (1740-3010)	3660 (3290-4450)	1369

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 2.0.

Urinary N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine (2011 – 2014)

CAS Number 33164-70-4

Metabolite of Crotonaldehyde

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	443 (417-471)	419 (383-446)	806 (735-856)	2000 (1720-2340)	3700 (3100-4230)	2466
Total population (2013 - 2014)	388 (355-423)	369 (345-403)	725 (663-804)	1730 (1430-2070)	3040 (2600-3420)	2593
Age 6-11 years (2011 - 2012)	318 (291-347)	347 (312-400)	569 (501-629)	861 (762-937)	1190 (871-1500)	394
Age 6-11 years (2013 - 2014)	290 (254-332)	309 (252-367)	501 (459-620)	838 (672-1040)	1140 (899-1650)	396
Age 12-19 years (2011 - 2012)	350 (292-421)	360 (301-439)	631 (532-750)	1130 (858-2190)	2200 (1100-4040)	384
Age 12-19 years (2013 - 2014)	329 (282-384)	339 (279-381)	579 (471-710)	1020 (762-1240)	1390 (1040-2070)	446
Age 20+ years (2011 - 2012)	477 (448-507)	439 (392-470)	874 (809-970)	2350 (2000-2730)	4160 (3580-4450)	1688
Age 20+ years (2013 - 2014)	410 (371-453)	393 (355-422)	785 (708-893)	2030 (1650-2420)	3360 (2980-4010)	1751
Males (2011 - 2012)	507 (470-546)	467 (425-502)	848 (746-982)	2010 (1520-2660)	3840 (3010-4320)	1251
Males (2013 - 2014)	412 (368-462)	401 (353-450)	729 (666-866)	1630 (1340-1830)	3230 (2560-3600)	1284
Females (2011 - 2012)	390 (349-435)	352 (304-413)	733 (630-834)	2000 (1360-2490)	3520 (2980-4190)	1215
Females (2013 - 2014)	365 (333-401)	346 (311-376)	719 (605-824)	1820 (1370-2250)	2910 (2290-4090)	1309
Mexican Americans (2011 - 2012)	389 (320-474)	393 (300-496)	767 (655-856)	1330 (990-1800)	2350 (1460-3010)	313
Mexican Americans (2013 - 2014)	332 (298-371)	344 (289-413)	565 (508-639)	951 (838-1170)	1480 (1020-2280)	448
Non-Hispanic blacks (2011 - 2012)	511 (454-576)	480 (446-525)	794 (691-899)	2190 (1530-2690)	3350 (2650-4850)	662
Non-Hispanic blacks (2013 - 2014)	527 (475-584)	464 (433-506)	908 (731-1130)	2900 (1880-3350)	3980 (3100-5070)	567
Non-Hispanic whites (2011 - 2012)	449 (411-492)	422 (366-456)	834 (706-930)	2120 (1680-2660)	3880 (3290-4370)	810
Non-Hispanic whites (2013 - 2014)	388 (339-445)	366 (321-410)	745 (666-872)	1820 (1420-2380)	3230 (2560-4090)	944
All Hispanics (2011 - 2012)	398 (348-455)	384 (333-451)	751 (651-838)	1460 (1080-2060)	2600 (1910-3270)	566
All Hispanics (2013 - 2014)	341 (310-374)	348 (291-413)	600 (536-658)	995 (893-1210)	1730 (1260-2280)	693
Asians (2011 - 2012)	336 (294-383)	339 (313-384)	588 (521-694)	1140 (944-1580)	1830 (1160-3090)	341
Asians (2013 - 2014)	292 (243-353)	291 (237-350)	512 (444-590)	1110 (798-1680)	2200 (1160-4720)	287

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 2.0 and 3.0, respectively.

Urinary N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 33164-70-4

Metabolite of Crotonaldehyde

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	426 (383-473)	328 (304-351)	651 (552-780)	2020 (1530-2540)	3390 (2870-3820)	3332
Age 12-19 years (2005 - 2006)	292 (269-317)	259 (240-281)	384 (336-412)	654 (526-795)	887 (701-1390)	1027
Age 20+ years (2005 - 2006)	452 (402-508)	344 (314-377)	717 (613-934)	2190 (1820-2800)	3630 (3160-4090)	2304
Males (2005 - 2006)	413 (366-467)	318 (291-355)	653 (525-844)	1940 (1350-2490)	3040 (2440-3660)	1583
Females (2005 - 2006)	438 (396-485)	335 (313-366)	641 (552-774)	2140 (1610-2650)	3680 (3290-4110)	1748
Mexican Americans (2005 - 2006)	343 (316-373)	299 (287-315)	446 (398-527)	887 (701-1140)	1390 (1080-1910)	816
Non-Hispanic blacks (2005 - 2006)	355 (312-405)	279 (250-311)	565 (445-804)	1560 (1300-1860)	2360 (1880-3090)	897
Non-Hispanic whites (2005 - 2006)	458 (399-524)	344 (309-393)	707 (598-1020)	2350 (1820-3040)	3680 (3330-4120)	1365

Urinary N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 33164-70-4

Metabolite of Crotonaldehyde

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	506 (473-540)	398 (370-419)	683 (613-760)	2050 (1720-2490)	3970 (3220-5200)	2464
Total population (2013 - 2014)	450 (412-493)	365 (338-397)	707 (626-798)	1750 (1510-2030)	2870 (2410-3310)	2592
Age 6-11 years (2011 - 2012)	450 (421-480)	425 (395-449)	534 (501-611)	843 (635-1110)	1100 (785-1970)	393
Age 6-11 years (2013 - 2014)	436 (390-486)	412 (361-448)	573 (518-647)	902 (798-1080)	1180 (975-1680)	396
Age 12-19 years (2011 - 2012)	341 (300-388)	308 (257-336)	431 (376-502)	909 (534-1430)	1430 (763-2400)	384
Age 12-19 years (2013 - 2014)	299 (274-325)	269 (241-291)	364 (326-416)	603 (476-914)	1360 (671-2410)	446
Age 20+ years (2011 - 2012)	543 (508-581)	408 (385-432)	760 (693-920)	2610 (2020-3280)	4700 (3510-5830)	1687
Age 20+ years (2013 - 2014)	481 (436-530)	387 (357-430)	817 (721-932)	1990 (1720-2330)	3190 (2630-3670)	1750
Males (2011 - 2012)	476 (442-511)	377 (351-405)	654 (600-770)	1780 (1480-2170)	3170 (2350-4230)	1250
Males (2013 - 2014)	414 (378-455)	348 (327-371)	600 (532-681)	1470 (1210-1780)	2410 (2140-2870)	1283
Females (2011 - 2012)	536 (483-596)	410 (379-444)	698 (605-855)	2700 (1570-3800)	4700 (3350-5710)	1214
Females (2013 - 2014)	488 (437-545)	390 (344-460)	805 (688-952)	2030 (1620-2460)	3310 (2580-5280)	1309
Mexican Americans (2011 - 2012)	439 (361-535)	362 (320-424)	581 (479-698)	1430 (1090-1850)	2240 (1660-4310)	313
Mexican Americans (2013 - 2014)	378 (340-421)	341 (316-359)	492 (442-532)	970 (720-1380)	1860 (984-2890)	448
Non-Hispanic blacks (2011 - 2012)	399 (364-437)	322 (293-360)	536 (471-641)	1450 (1050-1780)	2070 (1800-2680)	662
Non-Hispanic blacks (2013 - 2014)	403 (361-449)	309 (286-340)	682 (523-803)	1690 (1400-2270)	2490 (2040-3270)	567
Non-Hispanic whites (2011 - 2012)	548 (506-594)	411 (388-444)	730 (628-932)	2700 (1720-3550)	4700 (3280-6190)	808
Non-Hispanic whites (2013 - 2014)	481 (431-537)	390 (353-436)	817 (686-937)	1910 (1610-2390)	3140 (2480-3890)	943
All Hispanics (2011 - 2012)	445 (395-502)	361 (325-405)	607 (519-712)	1650 (1220-2020)	2700 (1850-3440)	566
All Hispanics (2013 - 2014)	381 (345-421)	336 (315-354)	505 (460-556)	1030 (795-1420)	2050 (1350-2880)	693
Asians (2011 - 2012)	449 (415-486)	393 (353-433)	575 (508-640)	1110 (806-1680)	2000 (1350-2410)	341
Asians (2013 - 2014)	465 (402-537)	417 (361-462)	695 (573-805)	1490 (947-2030)	2190 (1490-2680)	287

Urinary 2-Aminothiazoline-4-carboxylic acid (2005 – 2006)

CAS Number 40283-41-8

Metabolite of Cyanide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	66.0 (55.8-78.1)	88.1 (73.0-105)	212 (197-226)	379 (336-406)	497 (459-546)	3349
Age 12-19 years (2005 - 2006)	74.7 (61.3-91.0)	120 (93.3-146)	257 (221-290)	436 (399-504)	590 (497-684)	1034
Age 20+ years (2005 - 2006)	64.8 (54.4-77.0)	84.7 (68.6-103)	204 (188-220)	365 (326-398)	481 (450-533)	2313
Males (2005 - 2006)	*	55.5 (25.3-80.2)	159 (143-174)	293 (270-325)	426 (381-456)	1590
Females (2005 - 2006)	91.3 (78.2-107)	125 (106-143)	266 (233-288)	429 (387-465)	547 (490-628)	1756
Mexican Americans (2005 - 2006)	90.4 (79.5-103)	131 (119-152)	275 (248-299)	480 (426-560)	667 (574-753)	820
Non-Hispanic blacks (2005 - 2006)	73.9 (57.2-95.5)	117 (87.4-148)	274 (234-311)	458 (383-548)	603 (557-694)	900
Non-Hispanic whites (2005 - 2006)	61.6 (51.0-74.4)	80.2 (62.7-102)	188 (173-207)	340 (303-389)	456 (404-497)	1371

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 15.0.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Aminothiazoline-4-carboxylic acid (2011 – 2014)

CAS Number 40283-41-8

Metabolite of Cyanide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	110 (101-120)	120 (106-133)	234 (212-249)	410 (364-441)	558 (500-622)	2466
Total population (2013 - 2014)	102 (93.3-111)	105 (94.8-116)	228 (209-253)	406 (377-442)	540 (491-595)	2523
Age 6-11 years (2011 - 2012)	247 (227-270)	270 (239-308)	482 (394-583)	718 (641-835)	911 (749-1090)	394
Age 6-11 years (2013 - 2014)	203 (170-242)	243 (194-297)	413 (347-517)	614 (552-721)	764 (638-927)	382
Age 12-19 years (2011 - 2012)	118 (97.2-143)	133 (100-159)	266 (232-334)	435 (347-562)	583 (435-923)	384
Age 12-19 years (2013 - 2014)	123 (105-145)	131 (109-155)	262 (220-328)	449 (380-505)	529 (483-559)	424
Age 20+ years (2011 - 2012)	99.8 (90.3-110)	106 (98.9-121)	201 (181-228)	348 (304-407)	483 (393-545)	1688
Age 20+ years (2013 - 2014)	91.9 (83.7-101)	93.6 (83.8-106)	202 (177-222)	371 (339-400)	491 (442-554)	1717
Males (2011 - 2012)	92.0 (84.1-101)	98.4 (82.4-109)	191 (169-211)	361 (314-386)	493 (414-586)	1251
Males (2013 - 2014)	81.9 (74.5-90.0)	86.9 (79.5-96.9)	186 (171-209)	352 (317-377)	449 (401-491)	1247
Females (2011 - 2012)	131 (116-148)	147 (131-162)	275 (246-303)	447 (401-515)	589 (514-757)	1215
Females (2013 - 2014)	125 (113-138)	123 (107-146)	262 (232-299)	471 (412-530)	612 (540-757)	1276
Mexican Americans (2011 - 2012)	135 (109-168)	144 (106-184)	271 (191-374)	501 (364-671)	728 (537-872)	313
Mexican Americans (2013 - 2014)	143 (130-158)	151 (136-167)	293 (258-323)	471 (418-556)	695 (540-804)	430
Non-Hispanic blacks (2011 - 2012)	142 (124-163)	163 (122-201)	315 (264-383)	534 (485-604)	728 (651-816)	662
Non-Hispanic blacks (2013 - 2014)	136 (114-163)	142 (113-180)	314 (256-381)	554 (491-629)	775 (629-842)	559
Non-Hispanic whites (2011 - 2012)	99.5 (91.2-109)	107 (99.0-125)	202 (182-229)	356 (331-391)	482 (419-553)	810
Non-Hispanic whites (2013 - 2014)	88.6 (80.7-97.1)	90.7 (81.9-99.3)	198 (172-220)	363 (316-397)	491 (403-554)	920
All Hispanics (2011 - 2012)	135 (117-156)	139 (114-170)	268 (212-310)	483 (374-589)	671 (537-835)	566
All Hispanics (2013 - 2014)	137 (125-149)	149 (132-162)	286 (255-299)	464 (423-540)	684 (531-772)	662
Asians (2011 - 2012)	114 (100-131)	114 (102-130)	225 (181-290)	424 (335-520)	543 (440-671)	341
Asians (2013 - 2014)	97.8 (84.5-113)	95.0 (74.9-117)	236 (161-265)	376 (323-405)	437 (382-607)	280

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 15.0 and 15.0, respectively.

Urinary 2-Aminothiazoline-4-carboxylic acid (creatinine corrected) (2005 – 2006)

CAS Number 40283-41-8

Metabolite of Cyanide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	66.2 (54.9-79.8)	94.1 (81.5-106)	211 (191-231)	353 (332-374)	469 (424-497)	3340
Age 12-19 years (2005 - 2006)	57.2 (45.1-72.6)	96.1 (73.8-114)	194 (167-223)	318 (267-362)	398 (362-450)	1029
Age 20+ years (2005 - 2006)	67.7 (56.1-81.8)	94.0 (80.4-107)	216 (194-234)	354 (334-385)	474 (429-501)	2307
Males (2005 - 2006)	*	49.2 (35.8-65.7)	114 (107-121)	241 (208-268)	344 (320-395)	1586
Females (2005 - 2006)	111 (92.5-133)	153 (135-181)	263 (244-294)	403 (375-442)	528 (485-574)	1753
Mexican Americans (2005 - 2006)	81.1 (70.4-93.4)	122 (103-145)	234 (219-249)	383 (353-434)	521 (468-581)	817
Non-Hispanic blacks (2005 - 2006)	50.9 (39.5-65.7)	84.4 (67.7-101)	178 (158-196)	322 (283-355)	418 (366-481)	899
Non-Hispanic whites (2005 - 2006)	66.4 (54.2-81.4)	91.2 (73.5-107)	210 (185-235)	353 (321-385)	465 (417-501)	1368

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Urinary 2-Aminothiazoline-4-carboxylic acid (creatinine corrected) (2011 – 2014)

CAS Number 40283-41-8

Metabolite of Cyanide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	126 (118-134)	135 (123-147)	249 (228-272)	413 (380-438)	539 (489-588)	2464
Total population (2013 - 2014)	118 (108-129)	135 (122-148)	239 (217-264)	405 (363-468)	555 (503-610)	2522
Age 6-11 years (2011 - 2012)	352 (323-384)	375 (329-418)	540 (472-628)	742 (634-859)	926 (747-1000)	393
Age 6-11 years (2013 - 2014)	305 (266-351)	338 (284-382)	504 (413-593)	682 (587-849)	849 (671-1080)	382
Age 12-19 years (2011 - 2012)	115 (101-131)	125 (113-151)	214 (183-240)	338 (255-438)	438 (307-591)	384
Age 12-19 years (2013 - 2014)	112 (93.1-134)	127 (92.1-159)	205 (180-240)	340 (267-404)	453 (340-581)	424
Age 20+ years (2011 - 2012)	114 (105-123)	120 (111-134)	221 (201-241)	363 (336-379)	444 (411-514)	1687
Age 20+ years (2013 - 2014)	108 (98.2-118)	122 (107-136)	219 (197-244)	363 (307-422)	511 (439-562)	1716
Males (2011 - 2012)	86.4 (79.1-94.3)	80.2 (73.1-91.6)	169 (142-199)	328 (298-375)	471 (426-539)	1250
Males (2013 - 2014)	82.4 (75.5-89.8)	86.1 (75.6-98.1)	174 (154-189)	318 (275-356)	439 (381-529)	1246
Females (2011 - 2012)	181 (166-196)	189 (171-204)	312 (286-337)	440 (413-489)	577 (520-624)	1214
Females (2013 - 2014)	167 (149-187)	184 (166-202)	292 (255-340)	493 (404-549)	619 (537-753)	1276
Mexican Americans (2011 - 2012)	153 (121-192)	178 (149-215)	300 (228-353)	438 (363-539)	585 (450-800)	313
Mexican Americans (2013 - 2014)	165 (153-177)	179 (160-194)	312 (283-354)	521 (439-567)	633 (555-726)	430
Non-Hispanic blacks (2011 - 2012)	111 (98.4-125)	125 (106-147)	245 (212-276)	396 (325-458)	504 (445-544)	662
Non-Hispanic blacks (2013 - 2014)	104 (87.3-123)	104 (90.3-124)	249 (202-276)	404 (341-454)	555 (439-607)	559
Non-Hispanic whites (2011 - 2012)	121 (113-131)	123 (112-136)	230 (217-256)	413 (373-440)	539 (458-605)	808
Non-Hispanic whites (2013 - 2014)	110 (101-120)	125 (113-142)	219 (197-248)	377 (313-453)	514 (453-593)	919
All Hispanics (2011 - 2012)	152 (130-177)	178 (153-201)	286 (253-331)	423 (359-483)	568 (454-749)	566
All Hispanics (2013 - 2014)	154 (142-166)	170 (150-184)	301 (265-328)	496 (432-539)	617 (555-718)	662
Asians (2011 - 2012)	153 (137-172)	158 (141-190)	265 (232-309)	439 (342-525)	547 (459-691)	341
Asians (2013 - 2014)	155 (131-182)	166 (129-208)	292 (244-331)	467 (383-529)	625 (476-719)	280

Urinary N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine (2005 – 2006)

CAS Number 103974-29-4

Metabolite of N,N-Dimethylformamide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	137 (125-149)	139 (124-157)	302 (265-333)	600 (555-666)	883 (773-1030)	3344
Age 12-19 years (2005 - 2006)	95.8 (84.4-109)	98.8 (85.2-114)	179 (156-216)	323 (276-395)	490 (400-636)	1030
Age 20+ years (2005 - 2006)	144 (131-159)	150 (131-169)	327 (290-362)	643 (577-699)	941 (837-1070)	2310
Males (2005 - 2006)	158 (143-176)	162 (139-185)	344 (315-383)	625 (566-686)	877 (754-1000)	1588
Females (2005 - 2006)	118 (107-131)	118 (103-139)	257 (230-289)	577 (490-679)	903 (707-1220)	1753
Mexican Americans (2005 - 2006)	104 (95.4-113)	109 (96.4-123)	205 (177-234)	379 (306-509)	578 (489-735)	818
Non-Hispanic blacks (2005 - 2006)	139 (124-157)	131 (118-149)	293 (233-367)	628 (447-808)	871 (743-1030)	899
Non-Hispanic whites (2005 - 2006)	144 (128-163)	151 (131-174)	327 (280-383)	653 (562-718)	983 (774-1120)	1365

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 6.26.

Urinary N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine (2011 – 2014)

CAS Number 103974-29-4

Metabolite of N,N-Dimethylformamide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	138 (129-149)	136 (124-145)	289 (252-326)	557 (481-660)	847 (703-1010)	2466
Total population (2013 - 2014)	124 (112-136)	122 (109-135)	276 (238-309)	517 (472-578)	802 (691-897)	2629
Age 6-11 years (2011 - 2012)	59.1 (53.3-65.4)	64.2 (57.0-70.9)	111 (98.0-120)	159 (125-192)	192 (140-217)	394
Age 6-11 years (2013 - 2014)	53.4 (47.7-59.7)	57.8 (46.0-65.7)	97.0 (83.7-107)	150 (134-180)	196 (167-240)	396
Age 12-19 years (2011 - 2012)	87.7 (73.8-104)	84.7 (70.2-104)	163 (141-183)	279 (224-413)	446 (364-568)	384
Age 12-19 years (2013 - 2014)	87.7 (71.0-108)	82.2 (65.0-109)	156 (125-223)	297 (218-490)	463 (294-907)	448
Age 20+ years (2011 - 2012)	163 (151-176)	163 (148-180)	333 (302-364)	655 (564-702)	975 (773-1130)	1688
Age 20+ years (2013 - 2014)	142 (128-158)	141 (126-155)	315 (287-338)	583 (524-642)	869 (778-1010)	1785
Males (2011 - 2012)	153 (139-168)	151 (132-176)	289 (250-338)	540 (446-665)	882 (661-1130)	1251
Males (2013 - 2014)	127 (114-141)	122 (109-140)	281 (233-320)	500 (453-548)	786 (645-869)	1306
Females (2011 - 2012)	126 (113-140)	120 (108-138)	287 (228-333)	575 (456-702)	838 (686-1050)	1215
Females (2013 - 2014)	121 (108-135)	122 (105-136)	268 (218-315)	529 (450-631)	810 (663-938)	1323
Mexican Americans (2011 - 2012)	97.9 (83.0-116)	95.2 (78.9-116)	193 (161-211)	292 (238-378)	468 (316-732)	313
Mexican Americans (2013 - 2014)	100 (87.8-114)	101 (89.9-109)	198 (165-235)	351 (303-422)	500 (396-706)	450
Non-Hispanic blacks (2011 - 2012)	122 (110-135)	116 (106-132)	230 (195-252)	471 (361-572)	696 (584-791)	662
Non-Hispanic blacks (2013 - 2014)	138 (123-155)	125 (112-141)	290 (222-372)	602 (485-702)	928 (663-1130)	571
Non-Hispanic whites (2011 - 2012)	157 (143-173)	158 (140-180)	333 (302-363)	629 (526-702)	969 (715-1130)	810
Non-Hispanic whites (2013 - 2014)	134 (116-155)	134 (114-154)	303 (254-346)	577 (500-651)	869 (708-1030)	972
All Hispanics (2011 - 2012)	107 (87.6-129)	108 (87.8-130)	208 (159-259)	372 (286-452)	534 (420-725)	566
All Hispanics (2013 - 2014)	105 (92.4-120)	105 (92.5-123)	208 (170-244)	372 (304-497)	541 (409-708)	696
Asians (2011 - 2012)	79.9 (69.3-92.1)	77.3 (66.1-92.0)	161 (131-201)	299 (235-400)	522 (368-622)	341
Asians (2013 - 2014)	60.5 (51.7-70.7)	57.6 (47.9-72.2)	118 (99.3-148)	193 (165-244)	326 (200-492)	286

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 6.26 and 6.26, respectively.

Urinary N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 103974-29-4

Metabolite of N,N-Dimethylformamide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	137 (125-150)	135 (122-148)	252 (225-284)	534 (469-572)	780 (654-932)	3332
Age 12-19 years (2005 - 2006)	73.4 (68.7-78.4)	69.5 (64.2-75.8)	114 (103-128)	218 (183-252)	314 (232-405)	1027
Age 20+ years (2005 - 2006)	151 (136-168)	151 (135-167)	279 (246-317)	565 (514-600)	844 (700-989)	2304
Males (2005 - 2006)	130 (116-146)	128 (114-144)	237 (212-274)	458 (403-537)	596 (562-716)	1584
Females (2005 - 2006)	144 (131-158)	144 (125-158)	270 (238-300)	584 (533-653)	960 (803-1050)	1748
Mexican Americans (2005 - 2006)	93.1 (86.2-101)	92.1 (82.6-101)	155 (138-174)	254 (217-297)	373 (282-565)	816
Non-Hispanic blacks (2005 - 2006)	96.0 (88.4-104)	90.6 (81.8-99.6)	182 (159-207)	359 (280-417)	538 (407-596)	896
Non-Hispanic whites (2005 - 2006)	156 (138-176)	156 (136-178)	294 (249-357)	579 (516-654)	880 (716-1040)	1365

Urinary N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 103974-29-4

Metabolite of N,N-Dimethylformamide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	158 (147-170)	146 (136-155)	279 (257-315)	541 (454-649)	849 (693-959)	2464
Total population (2013 - 2014)	143 (129-159)	137 (124-151)	264 (238-297)	482 (431-538)	679 (602-900)	2628
Age 6-11 years (2011 - 2012)	84.7 (80.4-89.2)	82.3 (78.8-86.2)	110 (100-124)	152 (131-166)	171 (143-221)	393
Age 6-11 years (2013 - 2014)	79.9 (72.4-88.2)	80.7 (75.8-86.7)	107 (95.2-120)	150 (123-170)	173 (149-206)	396
Age 12-19 years (2011 - 2012)	85.4 (75.4-96.9)	77.7 (64.3-101)	121 (108-142)	191 (169-243)	262 (196-364)	384
Age 12-19 years (2013 - 2014)	79.5 (69.2-91.4)	72.5 (62.1-83.3)	115 (94.6-150)	217 (158-377)	415 (230-596)	448
Age 20+ years (2011 - 2012)	186 (173-199)	176 (164-190)	336 (308-364)	649 (525-747)	892 (781-1000)	1687
Age 20+ years (2013 - 2014)	166 (148-186)	163 (147-183)	305 (271-337)	518 (466-603)	823 (638-1080)	1784
Males (2011 - 2012)	144 (131-158)	136 (121-152)	245 (206-294)	458 (379-593)	711 (547-836)	1250
Males (2013 - 2014)	127 (116-140)	126 (114-138)	231 (205-260)	411 (357-462)	561 (485-668)	1305
Females (2011 - 2012)	173 (158-190)	156 (145-173)	321 (271-362)	686 (494-849)	921 (850-997)	1214
Females (2013 - 2014)	160 (140-183)	152 (132-169)	308 (255-376)	541 (455-668)	938 (636-1290)	1323
Mexican Americans (2011 - 2012)	111 (93.6-131)	98.4 (90.2-108)	170 (136-206)	286 (212-382)	442 (281-1080)	313
Mexican Americans (2013 - 2014)	115 (102-129)	116 (100-130)	183 (153-216)	317 (245-412)	462 (321-629)	450
Non-Hispanic blacks (2011 - 2012)	94.8 (87.1-103)	86.3 (77.1-95.6)	155 (133-176)	290 (257-330)	438 (353-526)	662
Non-Hispanic blacks (2013 - 2014)	105 (94.9-117)	88.6 (79.2-97.5)	215 (181-252)	423 (368-487)	518 (462-600)	571
Non-Hispanic whites (2011 - 2012)	192 (179-207)	178 (160-197)	356 (313-378)	692 (536-833)	921 (849-1000)	808
Non-Hispanic whites (2013 - 2014)	165 (145-187)	159 (137-183)	306 (270-347)	541 (458-647)	860 (639-1090)	971
All Hispanics (2011 - 2012)	119 (105-136)	108 (98.8-121)	183 (159-226)	336 (265-436)	500 (414-557)	566
All Hispanics (2013 - 2014)	118 (102-136)	118 (101-134)	195 (165-228)	323 (266-412)	506 (380-680)	696
Asians (2011 - 2012)	107 (97.5-117)	107 (92.0-122)	174 (150-198)	280 (240-338)	397 (292-533)	341
Asians (2013 - 2014)	95.2 (81.5-111)	91.3 (76.8-110)	165 (136-206)	278 (217-387)	416 (301-488)	286

Urinary Phenylglyoxylic acid (2005 – 2006)

CAS Number 611-73-4

Metabolite of Ethylbenzene and Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	98.8 (88.8-110)	144 (129-160)	305 (272-328)	483 (458-518)	664 (602-700)	3346
Age 12-19 years (2005 - 2006)	109 (91.2-131)	157 (125-200)	318 (288-352)	474 (432-548)	602 (499-713)	1029
Age 20+ years (2005 - 2006)	97.3 (87.3-108)	140 (125-158)	299 (267-325)	484 (457-518)	670 (604-722)	2312
Males (2005 - 2006)	115 (101-131)	173 (156-191)	329 (300-358)	523 (480-593)	699 (666-761)	1588
Females (2005 - 2006)	85.8 (75.3-97.7)	118 (102-138)	263 (240-300)	452 (396-491)	590 (507-660)	1755
Mexican Americans (2005 - 2006)	107 (84.2-137)	150 (107-196)	299 (260-333)	448 (402-538)	593 (534-672)	820
Non-Hispanic blacks (2005 - 2006)	122 (97.5-152)	178 (145-212)	334 (316-362)	523 (476-577)	660 (577-715)	899
Non-Hispanic whites (2005 - 2006)	93.5 (84.2-104)	135 (118-152)	297 (268-321)	482 (453-518)	689 (606-742)	1370

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 12.0.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet: <https://www.cdc.gov/biomonitoring/>

Factsheet: https://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary Phenylglyoxylic acid (2011 – 2014)

CAS Number 611-73-4

Metabolite of Ethylbenzene and Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	177 (165-191)	199 (184-212)	334 (314-359)	491 (451-559)	706 (630-789)	2466
Total population (2013 - 2014)	169 (155-184)	178 (162-190)	318 (291-353)	505 (459-561)	657 (614-725)	2575
Age 6-11 years (2011 - 2012)	161 (148-176)	184 (161-202)	282 (255-312)	393 (347-456)	508 (393-594)	394
Age 6-11 years (2013 - 2014)	151 (133-171)	155 (142-178)	280 (228-330)	411 (349-514)	515 (420-649)	389
Age 12-19 years (2011 - 2012)	173 (152-197)	193 (165-222)	341 (307-392)	468 (423-579)	662 (505-872)	384
Age 12-19 years (2013 - 2014)	179 (157-205)	197 (155-246)	319 (276-384)	445 (385-561)	561 (445-744)	443
Age 20+ years (2011 - 2012)	180 (165-197)	203 (184-219)	341 (314-369)	514 (448-596)	732 (653-842)	1688
Age 20+ years (2013 - 2014)	169 (154-186)	179 (164-193)	327 (290-357)	533 (477-605)	688 (617-798)	1743
Males (2011 - 2012)	201 (179-226)	225 (198-248)	369 (329-411)	540 (468-588)	789 (592-900)	1251
Males (2013 - 2014)	183 (160-208)	191 (169-229)	335 (291-384)	514 (453-590)	637 (608-692)	1282
Females (2011 - 2012)	157 (143-172)	171 (157-193)	298 (273-332)	447 (412-518)	660 (502-771)	1215
Females (2013 - 2014)	156 (145-169)	158 (145-177)	305 (279-336)	491 (454-555)	682 (612-758)	1293
Mexican Americans (2011 - 2012)	149 (123-181)	166 (141-185)	279 (209-347)	423 (347-505)	505 (431-706)	313
Mexican Americans (2013 - 2014)	151 (138-166)	159 (139-176)	276 (250-311)	418 (389-468)	504 (468-611)	449
Non-Hispanic blacks (2011 - 2012)	217 (198-237)	229 (204-255)	369 (342-390)	570 (489-647)	771 (683-937)	662
Non-Hispanic blacks (2013 - 2014)	223 (204-244)	237 (215-260)	369 (349-401)	612 (531-647)	738 (634-1110)	568
Non-Hispanic whites (2011 - 2012)	180 (165-196)	205 (184-220)	340 (316-365)	493 (439-585)	726 (578-861)	810
Non-Hispanic whites (2013 - 2014)	168 (147-193)	177 (154-203)	334 (283-376)	514 (452-605)	674 (606-764)	935
All Hispanics (2011 - 2012)	154 (130-183)	169 (146-192)	283 (233-359)	442 (393-558)	604 (464-711)	566
All Hispanics (2013 - 2014)	158 (143-175)	169 (146-184)	283 (255-313)	435 (400-490)	550 (490-616)	695
Asians (2011 - 2012)	139 (120-160)	161 (131-187)	266 (221-302)	398 (330-489)	518 (410-617)	341
Asians (2013 - 2014)	111 (94.6-131)	113 (92.6-152)	208 (184-231)	296 (278-358)	400 (310-458)	281

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 12.0 and 12.0, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Urinary Phenylglyoxylic acid (creatinine corrected) (2005 – 2006)

CAS Number 611-73-4

Metabolite of Ethylbenzene and Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	99.1 (89.5-110)	136 (126-149)	220 (208-238)	328 (308-362)	434 (414-467)	3334
Age 12-19 years (2005 - 2006)	83.6 (71.9-97.2)	122 (107-137)	198 (180-208)	274 (249-321)	335 (308-403)	1027
Age 20+ years (2005 - 2006)	102 (91.7-113)	139 (128-152)	226 (213-243)	336 (309-382)	451 (423-499)	2305
Males (2005 - 2006)	93.9 (83.2-106)	133 (120-148)	212 (203-220)	314 (296-334)	429 (399-445)	1585
Females (2005 - 2006)	104 (93.1-117)	140 (126-156)	235 (215-253)	345 (314-379)	451 (423-498)	1749
Mexican Americans (2005 - 2006)	96.3 (78.5-118)	131 (103-164)	210 (187-236)	291 (252-376)	382 (304-451)	816
Non-Hispanic blacks (2005 - 2006)	83.9 (68.2-103)	129 (113-139)	189 (167-214)	285 (255-328)	372 (328-433)	896
Non-Hispanic whites (2005 - 2006)	101 (91.4-111)	138 (127-155)	229 (213-247)	352 (314-402)	464 (429-509)	1365

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet: <https://www.cdc.gov/biomonitoring/>

Factsheet: https://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary Phenylglyoxylic acid (creatinine corrected) (2011 – 2014)

CAS Number 611-73-4

Metabolite of Ethylbenzene and Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	202 (189-217)	206 (195-219)	285 (269-301)	401 (377-426)	518 (468-568)	2464
Total population (2013 - 2014)	194 (176-214)	195 (180-213)	279 (256-304)	420 (372-484)	562 (501-657)	2574
Age 6-11 years (2011 - 2012)	231 (219-244)	239 (221-256)	310 (297-323)	411 (377-436)	467 (416-502)	393
Age 6-11 years (2013 - 2014)	227 (199-258)	240 (204-261)	311 (266-363)	394 (356-446)	476 (380-844)	389
Age 12-19 years (2011 - 2012)	168 (150-189)	181 (167-193)	239 (212-256)	285 (261-336)	368 (285-550)	384
Age 12-19 years (2013 - 2014)	163 (151-176)	170 (161-179)	220 (192-238)	311 (248-357)	397 (327-405)	443
Age 20+ years (2011 - 2012)	205 (191-220)	207 (195-220)	288 (272-310)	413 (384-442)	536 (482-602)	1687
Age 20+ years (2013 - 2014)	196 (177-218)	197 (179-215)	284 (257-311)	456 (382-517)	583 (517-707)	1742
Males (2011 - 2012)	189 (174-205)	194 (178-207)	270 (244-299)	400 (367-418)	517 (481-538)	1250
Males (2013 - 2014)	184 (164-206)	188 (170-204)	256 (240-279)	380 (330-454)	531 (427-657)	1281
Females (2011 - 2012)	217 (199-235)	223 (202-239)	291 (274-318)	404 (366-460)	536 (448-598)	1214
Females (2013 - 2014)	205 (185-229)	201 (184-224)	300 (268-333)	467 (387-523)	595 (517-800)	1293
Mexican Americans (2011 - 2012)	168 (135-210)	177 (160-198)	240 (220-265)	311 (267-413)	413 (311-520)	313
Mexican Americans (2013 - 2014)	172 (163-183)	174 (166-183)	238 (230-252)	322 (281-401)	444 (349-617)	449
Non-Hispanic blacks (2011 - 2012)	169 (160-179)	171 (158-180)	233 (221-243)	308 (291-334)	395 (355-431)	662
Non-Hispanic blacks (2013 - 2014)	171 (151-192)	170 (155-185)	253 (222-301)	407 (347-435)	485 (435-543)	568
Non-Hispanic whites (2011 - 2012)	220 (207-234)	224 (210-233)	304 (281-336)	426 (395-481)	562 (481-660)	808
Non-Hispanic whites (2013 - 2014)	207 (182-234)	205 (186-227)	295 (262-331)	464 (385-540)	596 (517-765)	934
All Hispanics (2011 - 2012)	173 (150-199)	179 (164-197)	243 (226-265)	317 (295-344)	390 (354-476)	566
All Hispanics (2013 - 2014)	176 (162-191)	178 (165-188)	247 (228-275)	359 (306-401)	458 (396-595)	695
Asians (2011 - 2012)	186 (169-204)	187 (173-208)	257 (241-277)	336 (315-381)	419 (351-515)	341
Asians (2013 - 2014)	174 (155-196)	183 (161-206)	256 (225-286)	345 (284-415)	400 (319-551)	281

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Ethylbenzene_BiomonitoringSummary.html

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet: <https://www.cdc.gov/biomonitoring/>

Factsheet: https://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary N-Acetyl-S-(2-hydroxypropyl)-L-cysteine (2005 – 2006)

CAS Number 923-43-3

Metabolite of Propylene oxide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	36.7 (34.5-39.0)	37.7 (35.3-40.4)	73.4 (68.8-79.4)	149 (127-177)	233 (204-274)	3349
Age 12-19 years (2005 - 2006)	38.6 (34.5-43.3)	39.8 (36.0-44.8)	71.4 (62.3-78.7)	122 (94.0-163)	179 (122-348)	1033
Age 20+ years (2005 - 2006)	36.4 (34.0-38.9)	37.5 (34.8-40.1)	74.7 (68.1-80.7)	153 (131-183)	239 (214-274)	2313
Males (2005 - 2006)	43.0 (39.8-46.6)	43.6 (38.4-48.2)	80.0 (73.4-90.7)	166 (134-204)	253 (204-343)	1591
Females (2005 - 2006)	31.5 (28.8-34.4)	32.5 (30.0-36.2)	64.8 (59.1-72.1)	134 (118-161)	220 (185-252)	1755
Mexican Americans (2005 - 2006)	36.2 (32.4-40.5)	38.3 (34.4-44.0)	70.8 (60.3-80.7)	136 (114-154)	198 (150-259)	820
Non-Hispanic blacks (2005 - 2006)	46.6 (42.4-51.1)	48.0 (43.7-52.0)	86.0 (72.1-106)	160 (134-196)	219 (196-287)	901
Non-Hispanic whites (2005 - 2006)	35.8 (32.7-39.2)	36.3 (33.0-39.5)	73.4 (66.0-80.7)	150 (120-185)	247 (204-294)	1370

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 5.3.

Urinary N-Acetyl-S-(2-hydroxypropyl)-L-cysteine (2011 – 2014)

CAS Number 923-43-3

Metabolite of Propylene oxide

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	32.1 (29.3-35.1)	30.6 (27.6-32.7)	60.2 (55.8-64.6)	124 (111-142)	249 (181-313)	2466
Total population (2013 - 2014)	26.5 (23.9-29.2)	25.2 (22.5-27.7)	52.9 (45.6-59.1)	106 (91.4-118)	173 (144-198)	2597
Age 6-11 years (2011 - 2012)	24.8 (21.7-28.3)	24.2 (21.2-29.6)	40.9 (36.8-52.0)	77.7 (63.5-95.2)	129 (88.1-160)	394
Age 6-11 years (2013 - 2014)	20.9 (17.8-24.5)	22.3 (17.0-26.1)	41.0 (33.9-47.9)	71.1 (58.5-105)	128 (73.5-208)	391
Age 12-19 years (2011 - 2012)	26.2 (21.6-31.7)	26.0 (21.3-31.8)	47.5 (39.6-58.5)	81.5 (58.5-105)	112 (82.1-203)	384
Age 12-19 years (2013 - 2014)	27.7 (22.6-34.0)	26.5 (22.2-31.0)	46.3 (40.6-60.2)	86.9 (70.8-125)	175 (104-596)	444
Age 20+ years (2011 - 2012)	34.1 (30.8-37.7)	32.1 (29.6-33.8)	65.7 (59.6-71.1)	142 (120-167)	286 (199-382)	1688
Age 20+ years (2013 - 2014)	26.9 (23.9-30.4)	25.3 (21.9-29.2)	55.5 (47.2-64.0)	109 (91.9-127)	177 (143-206)	1762
Males (2011 - 2012)	34.6 (31.0-38.6)	32.7 (29.7-35.9)	61.3 (52.1-70.6)	107 (95.7-140)	202 (142-270)	1251
Males (2013 - 2014)	27.8 (24.8-31.1)	26.4 (23.5-29.7)	52.9 (44.8-60.7)	103 (90.4-113)	172 (137-194)	1287
Females (2011 - 2012)	29.9 (25.9-34.5)	26.8 (23.3-31.8)	59.1 (49.9-67.8)	137 (121-162)	293 (167-442)	1215
Females (2013 - 2014)	25.3 (22.5-28.4)	24.0 (20.5-28.5)	53.2 (43.8-60.7)	108 (85.4-130)	177 (136-230)	1310
Mexican Americans (2011 - 2012)	32.9 (27.8-39.0)	31.8 (26.0-37.0)	53.6 (45.6-62.4)	101 (81.0-178)	205 (111-498)	313
Mexican Americans (2013 - 2014)	26.0 (23.4-28.8)	26.9 (23.0-29.5)	51.4 (44.6-56.4)	84.0 (75.5-115)	135 (89.7-228)	451
Non-Hispanic blacks (2011 - 2012)	37.2 (32.9-42.0)	35.6 (32.9-39.7)	64.0 (58.0-71.1)	120 (103-142)	182 (148-211)	662
Non-Hispanic blacks (2013 - 2014)	35.5 (32.7-38.6)	35.0 (32.3-37.9)	63.5 (57.4-69.3)	112 (99.5-129)	173 (126-219)	565
Non-Hispanic whites (2011 - 2012)	32.0 (28.5-35.9)	29.7 (25.5-32.8)	61.8 (54.7-68.4)	130 (107-162)	286 (178-392)	810
Non-Hispanic whites (2013 - 2014)	25.5 (22.3-29.2)	23.7 (20.5-26.9)	49.5 (42.5-60.7)	109 (87.3-130)	177 (137-208)	952
All Hispanics (2011 - 2012)	30.7 (26.4-35.8)	28.9 (24.7-33.6)	52.2 (42.6-66.2)	101 (82.6-147)	191 (138-235)	566
All Hispanics (2013 - 2014)	26.6 (23.7-30.0)	26.9 (23.1-30.3)	53.3 (44.6-60.2)	87.0 (77.7-112)	137 (105-198)	694
Asians (2011 - 2012)	25.8 (22.0-30.3)	24.4 (21.8-29.1)	48.4 (40.6-59.6)	99.0 (78.8-117)	202 (110-320)	341
Asians (2013 - 2014)	21.0 (16.6-26.7)	19.1 (16.0-21.7)	37.6 (27.6-51.2)	106 (53.0-204)	204 (99.6-892)	285

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 5.3 and 5.3, respectively.

Urinary N-Acetyl-S-(2-hydroxypropyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 923-43-3

Metabolite of Propylene oxide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	36.8 (34.1-39.7)	33.4 (30.6-37.2)	62.0 (57.6-68.8)	131 (119-144)	183 (166-196)	3333
Age 12-19 years (2005 - 2006)	29.6 (27.9-31.4)	28.5 (26.6-30.6)	45.1 (42.2-48.0)	81.2 (69.8-93.0)	124 (88.6-159)	1027
Age 20+ years (2005 - 2006)	38.1 (35.1-41.3)	34.3 (32.0-38.4)	65.9 (59.5-73.4)	138 (123-151)	188 (169-220)	2306
Males (2005 - 2006)	35.3 (32.3-38.4)	32.2 (30.2-35.2)	59.4 (52.6-67.8)	117 (93.5-144)	169 (139-212)	1583
Females (2005 - 2006)	38.3 (34.1-43.1)	34.4 (30.3-39.9)	67.9 (59.8-77.6)	142 (123-158)	195 (170-229)	1750
Mexican Americans (2005 - 2006)	32.5 (29.4-35.9)	32.5 (29.6-34.3)	51.9 (47.6-57.8)	92.6 (78.5-103)	130 (105-165)	816
Non-Hispanic blacks (2005 - 2006)	32.1 (30.1-34.2)	30.3 (28.5-32.6)	53.2 (44.6-60.2)	100 (81.5-125)	141 (124-163)	897
Non-Hispanic whites (2005 - 2006)	38.6 (34.6-43.1)	34.6 (30.4-40.8)	67.8 (60.4-77.6)	145 (125-161)	196 (173-235)	1365

Urinary N-Acetyl-S-(2-hydroxypropyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 923-43-3

Metabolite of Propylene oxide

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	36.6 (33.3-40.2)	30.9 (28.8-32.4)	55.1 (51.7-61.8)	121 (105-143)	220 (189-315)	2464
Total population (2013 - 2014)	30.5 (27.2-34.2)	26.6 (24.1-29.7)	48.0 (43.0-56.9)	106 (92.1-126)	180 (151-218)	2596
Age 6-11 years (2011 - 2012)	35.3 (31.8-39.2)	32.3 (29.3-34.4)	50.7 (44.9-56.0)	87.6 (63.7-118)	128 (87.6-187)	393
Age 6-11 years (2013 - 2014)	31.1 (27.3-35.5)	28.7 (24.1-31.7)	46.4 (35.8-57.5)	82.0 (64.4-112)	169 (81.7-278)	391
Age 12-19 years (2011 - 2012)	25.5 (22.9-28.3)	23.1 (20.8-24.7)	36.5 (31.7-43.1)	53.7 (44.0-76.0)	85.5 (62.7-118)	384
Age 12-19 years (2013 - 2014)	25.1 (20.8-30.3)	21.2 (18.3-26.1)	35.6 (32.0-41.5)	85.2 (46.2-147)	154 (53.3-411)	444
Age 20+ years (2011 - 2012)	38.8 (35.0-43.1)	31.9 (29.8-34.5)	61.5 (53.6-70.4)	141 (121-167)	269 (198-426)	1687
Age 20+ years (2013 - 2014)	31.3 (27.6-35.5)	27.3 (24.7-31.1)	52.2 (43.8-61.3)	113 (93.8-137)	190 (152-238)	1761
Males (2011 - 2012)	32.4 (29.7-35.5)	28.8 (27.0-31.3)	47.4 (43.6-53.5)	88.2 (72.6-113)	143 (118-201)	1250
Males (2013 - 2014)	27.7 (24.6-31.1)	25.2 (22.6-29.0)	43.6 (39.1-46.9)	86.8 (72.7-105)	140 (111-161)	1286
Females (2011 - 2012)	41.2 (34.8-48.7)	32.8 (28.8-37.3)	68.5 (54.2-79.7)	164 (122-208)	324 (190-878)	1214
Females (2013 - 2014)	33.5 (29.1-38.6)	27.9 (24.8-32.0)	56.9 (44.5-68.6)	128 (97.8-167)	218 (162-307)	1310
Mexican Americans (2011 - 2012)	37.2 (32.6-42.3)	30.1 (28.4-34.3)	52.5 (44.6-63.1)	113 (80.9-141)	191 (101-905)	313
Mexican Americans (2013 - 2014)	29.7 (27.6-31.9)	27.5 (25.2-32.2)	44.1 (39.8-50.3)	90.9 (71.9-112)	156 (95.7-252)	451
Non-Hispanic blacks (2011 - 2012)	29.0 (25.8-32.6)	26.4 (23.4-30.3)	44.5 (40.6-49.0)	81.6 (66.6-93.8)	122 (93.8-167)	662
Non-Hispanic blacks (2013 - 2014)	26.9 (23.5-30.8)	25.5 (21.1-29.1)	43.8 (35.3-52.1)	78.8 (57.7-108)	120 (83.9-173)	565
Non-Hispanic whites (2011 - 2012)	39.0 (34.9-43.7)	31.9 (29.2-34.5)	60.7 (53.0-70.4)	143 (111-179)	267 (190-426)	808
Non-Hispanic whites (2013 - 2014)	31.3 (27.5-35.6)	26.8 (24.0-29.8)	49.7 (41.7-60.5)	117 (96.6-149)	200 (156-241)	951
All Hispanics (2011 - 2012)	34.4 (31.1-38.0)	29.1 (27.6-31.2)	47.6 (42.6-56.1)	96.5 (74.3-128)	161 (106-291)	566
All Hispanics (2013 - 2014)	29.8 (27.1-32.8)	27.2 (24.3-32.3)	46.3 (41.6-53.2)	92.1 (75.6-115)	166 (115-248)	694
Asians (2011 - 2012)	34.5 (28.7-41.4)	30.0 (24.7-35.9)	57.9 (45.3-71.1)	118 (84.8-209)	251 (134-373)	341
Asians (2013 - 2014)	33.0 (26.1-41.9)	28.8 (21.1-37.5)	53.9 (42.5-73.4)	101 (62.1-303)	303 (93.6-846)	285

Urinary N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine (2005 – 2006)

CAS Number 923-43-3

Metabolite of Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	1.87 (1.59-2.22)	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.51 (<LOD-3.00)	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.87 (1.57-2.32)	2313
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	1.95 (1.57-2.48)	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	1.73 (<LOD-2.91)	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	1.16 (<LOD-1.66)	2.44 (1.61-4.51)	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	1.21 (<LOD-1.73)	3.03 (1.78-4.36)	902
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	1.49 (<LOD-2.15)	1371

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 0.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine (2011 – 2014) **

CAS Number 923-43-3

and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	.933 (.843-1.04)	1.90 (1.74-2.17)	3.20 (2.75-3.63)	2466
Total population (2013 - 2014)	*	< LOD	1.03 (.885-1.18)	1.88 (1.73-2.10)	2.94 (2.55-3.42)	2569
Age 6-11 years (2011 - 2012)	*	< LOD	.929 (<LOD-1.12)	1.98 (1.42-3.06)	3.21 (1.98-5.67)	394
Age 6-11 years (2013 - 2014)	*	< LOD	.864 (<LOD-1.00)	1.43 (1.18-1.52)	1.79 (1.43-3.57)	387
Age 12-19 years (2011 - 2012)	*	< LOD	.882 (<LOD-1.11)	1.88 (1.42-2.16)	2.50 (1.90-4.61)	384
Age 12-19 years (2013 - 2014)	*	< LOD	.986 (<LOD-1.21)	1.60 (1.27-1.94)	2.14 (1.75-3.14)	433
Age 20+ years (2011 - 2012)	*	< LOD	.942 (.819-1.08)	1.91 (1.66-2.32)	3.26 (2.71-3.93)	1688
Age 20+ years (2013 - 2014)	*	< LOD	1.08 (.900-1.21)	2.04 (1.84-2.29)	3.18 (2.71-3.56)	1749
Males (2011 - 2012)	*	< LOD	.988 (.820-1.19)	2.06 (1.80-2.70)	3.60 (2.71-5.41)	1251
Males (2013 - 2014)	*	< LOD	1.03 (.866-1.21)	1.95 (1.67-2.17)	3.11 (2.45-3.71)	1273
Females (2011 - 2012)	*	< LOD	.887 (.807-.987)	1.75 (1.58-1.85)	2.95 (2.27-3.26)	1215
Females (2013 - 2014)	*	< LOD	1.04 (.813-1.21)	1.85 (1.71-2.16)	2.87 (2.35-3.56)	1296
Mexican Americans (2011 - 2012)	*	< LOD	.887 (.706-1.09)	1.69 (1.51-1.93)	2.39 (1.73-3.87)	313
Mexican Americans (2013 - 2014)	*	< LOD	1.03 (.887-1.19)	1.79 (1.50-2.15)	2.56 (2.02-3.05)	435
Non-Hispanic blacks (2011 - 2012)	*	< LOD	1.40 (1.23-1.58)	3.02 (2.39-3.56)	4.14 (3.56-5.65)	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	1.63 (1.36-1.96)	3.39 (2.55-4.66)	4.78 (3.87-5.55)	547
Non-Hispanic whites (2011 - 2012)	*	< LOD	.807 (<LOD-.920)	1.79 (1.57-1.93)	2.95 (2.13-3.57)	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	.949 (<LOD-1.19)	1.73 (1.54-1.98)	2.57 (2.08-3.37)	960
All Hispanics (2011 - 2012)	*	< LOD	1.04 (.865-1.26)	1.93 (1.69-2.39)	2.99 (2.24-3.69)	566
All Hispanics (2013 - 2014)	*	< LOD	1.10 (.930-1.29)	1.90 (1.57-2.59)	2.81 (2.14-3.79)	675
Asians (2011 - 2012)	*	< LOD	< LOD	1.34 (1.01-1.73)	1.95 (1.35-2.83)	341
Asians (2013 - 2014)	*	< LOD	< LOD	1.37 (1.16-1.49)	1.66 (1.46-2.08)	284

**Concentrations of N-Acetyl-S-(1-phenyl-2-hydroxyethyl) and (2-phenyl-2-hydroxyethyl)-L-cysteine were measured together and are reported as N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine. Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.7 and 0.7, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Urinary N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 923-43-3

Metabolite of Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	2.66 (2.25-3.09)	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	1.65 (<LOD-2.25)	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	2.73 (2.41-3.09)	2312
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	2.06 (1.77-2.61)	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	2.91 (<LOD-3.81)	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	1.65 (<LOD-2.06)	2.36 (1.68-4.13)	821
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	1.37 (<LOD-1.63)	2.25 (1.71-2.87)	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	2.66 (<LOD-3.09)	1371

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine (creatinine corrected) (2011 – 2014) **

CAS Number 923-43-3

Metabolite of Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	1.34 (1.27-1.41)	2.28 (2.06-2.61)	3.34 (2.75-4.13)	2464
Total population (2013 - 2014)	*	< LOD	1.41 (1.27-1.50)	2.36 (2.18-2.61)	3.30 (2.97-3.54)	2568
Age 6-11 years (2011 - 2012)	*	< LOD	1.64 (<LOD-1.83)	2.61 (2.06-3.45)	3.81 (2.90-5.50)	393
Age 6-11 years (2013 - 2014)	*	< LOD	1.65 (<LOD-1.84)	2.50 (1.98-3.09)	3.30 (2.74-4.50)	387
Age 12-19 years (2011 - 2012)	*	< LOD	1.15 (<LOD-1.30)	1.96 (1.38-2.61)	3.09 (1.85-5.50)	384
Age 12-19 years (2013 - 2014)	*	< LOD	.971 (<LOD-1.08)	1.41 (1.24-1.66)	1.98 (1.55-2.36)	433
Age 20+ years (2011 - 2012)	*	< LOD	1.34 (1.27-1.43)	2.36 (2.06-2.64)	3.34 (2.75-4.13)	1687
Age 20+ years (2013 - 2014)	*	< LOD	1.46 (1.30-1.60)	2.48 (2.25-2.75)	3.54 (3.02-3.84)	1748
Males (2011 - 2012)	*	< LOD	1.13 (1.05-1.24)	1.96 (1.71-2.17)	2.91 (2.61-3.34)	1250
Males (2013 - 2014)	*	< LOD	1.18 (1.08-1.32)	2.06 (1.73-2.36)	2.92 (2.40-3.54)	1272
Females (2011 - 2012)	*	< LOD	1.60 (1.40-1.77)	2.48 (2.17-2.85)	3.81 (2.75-4.88)	1214
Females (2013 - 2014)	*	< LOD	1.59 (1.46-1.77)	2.62 (2.32-2.91)	3.69 (2.91-4.34)	1296
Mexican Americans (2011 - 2012)	*	< LOD	1.21 (1.10-1.38)	2.23 (1.77-2.61)	2.69 (2.29-3.30)	313
Mexican Americans (2013 - 2014)	*	< LOD	1.34 (1.18-1.55)	1.98 (1.78-2.27)	2.75 (2.27-3.54)	435
Non-Hispanic blacks (2011 - 2012)	*	< LOD	1.17 (1.05-1.26)	1.89 (1.72-2.38)	2.91 (2.47-3.54)	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	1.28 (1.11-1.39)	2.23 (1.86-2.66)	3.06 (2.66-3.83)	547
Non-Hispanic whites (2011 - 2012)	*	< LOD	1.34 (<LOD-1.48)	2.35 (1.98-2.75)	3.45 (2.82-4.31)	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	1.41 (<LOD-1.56)	2.48 (2.25-2.75)	3.54 (2.91-4.00)	959
All Hispanics (2011 - 2012)	*	< LOD	1.36 (1.20-1.46)	2.19 (1.98-2.59)	2.75 (2.61-3.09)	566
All Hispanics (2013 - 2014)	*	< LOD	1.39 (1.21-1.58)	2.15 (1.94-2.48)	2.97 (2.48-4.11)	675
Asians (2011 - 2012)	*	< LOD	< LOD	2.36 (1.71-3.30)	3.54 (2.61-4.95)	341
Asians (2013 - 2014)	*	< LOD	< LOD	2.25 (1.83-3.61)	3.66 (2.36-4.32)	284

**Concentrations of N-Acetyl-S-(1-phenyl-2-hydroxyethyl) and (2-phenyl-2-hydroxyethyl)-L-cysteine were measured together and are reported as N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine. < LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary Mandelic acid (2005 – 2006)

CAS Number 90-64-2, 611-71-2 (R), 17199-29-0 (S)

Metabolite of Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	139 (132-147)	146 (139-152)	248 (232-261)	409 (385-442)	584 (511-661)	3347
Age 12-19 years (2005 - 2006)	139 (126-154)	151 (136-165)	224 (210-247)	322 (291-357)	394 (349-495)	1034
Age 20+ years (2005 - 2006)	139 (132-148)	146 (137-152)	254 (234-269)	424 (393-450)	607 (537-680)	2311
Males (2005 - 2006)	164 (154-174)	167 (155-183)	287 (259-305)	446 (409-511)	643 (534-767)	1591
Females (2005 - 2006)	119 (112-127)	124 (116-132)	220 (204-234)	359 (327-389)	526 (415-614)	1754
Mexican Americans (2005 - 2006)	141 (130-154)	156 (145-171)	246 (220-271)	374 (327-409)	459 (393-632)	821
Non-Hispanic blacks (2005 - 2006)	172 (155-190)	177 (155-197)	291 (251-338)	480 (402-556)	643 (505-777)	899
Non-Hispanic whites (2005 - 2006)	135 (126-144)	139 (132-148)	242 (223-263)	410 (380-445)	576 (511-661)	1371

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 12.0.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary Mandelic acid (2011 – 2014)

CAS Number 90-64-2, 611-71-2 (R), 17199-29-0 (S)

Metabolite of Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	123 (113-135)	128 (118-143)	223 (200-252)	360 (327-395)	501 (434-577)	2466
Total population (2013 - 2014)	112 (102-123)	115 (105-128)	209 (187-234)	348 (329-370)	487 (431-573)	2541
Age 6-11 years (2011 - 2012)	93.4 (86.4-101)	95.0 (86.6-110)	165 (146-188)	263 (199-304)	326 (269-406)	394
Age 6-11 years (2013 - 2014)	86.6 (75.5-99.3)	90.0 (80.9-105)	159 (122-197)	262 (199-332)	339 (294-385)	380
Age 12-19 years (2011 - 2012)	110 (95.6-126)	118 (102-138)	200 (170-241)	284 (248-343)	357 (286-543)	384
Age 12-19 years (2013 - 2014)	110 (91.7-131)	118 (93.4-142)	196 (167-248)	340 (236-389)	389 (337-448)	430
Age 20+ years (2011 - 2012)	129 (116-144)	134 (119-152)	233 (207-264)	384 (351-424)	543 (449-653)	1688
Age 20+ years (2013 - 2014)	115 (105-127)	119 (106-130)	214 (194-243)	366 (337-387)	547 (442-673)	1731
Males (2011 - 2012)	143 (131-157)	148 (126-165)	241 (207-275)	384 (329-459)	577 (456-797)	1251
Males (2013 - 2014)	120 (106-137)	128 (112-148)	216 (188-257)	356 (330-377)	472 (420-574)	1263
Females (2011 - 2012)	106 (94.2-120)	114 (101-124)	207 (177-230)	348 (298-386)	434 (381-544)	1215
Females (2013 - 2014)	104 (95.9-114)	105 (97.8-114)	196 (181-218)	340 (305-375)	501 (415-631)	1278
Mexican Americans (2011 - 2012)	120 (106-136)	129 (117-143)	200 (171-220)	269 (244-300)	356 (277-771)	313
Mexican Americans (2013 - 2014)	112 (99.8-127)	115 (95.7-143)	205 (181-233)	321 (273-359)	390 (340-443)	443
Non-Hispanic blacks (2011 - 2012)	157 (143-173)	159 (138-183)	251 (226-295)	431 (380-476)	622 (499-721)	662
Non-Hispanic blacks (2013 - 2014)	155 (140-172)	153 (142-165)	256 (231-292)	502 (417-567)	846 (547-992)	537
Non-Hispanic whites (2011 - 2012)	119 (106-133)	123 (114-137)	220 (186-261)	365 (327-410)	488 (423-566)	810
Non-Hispanic whites (2013 - 2014)	108 (94.2-124)	112 (95.9-128)	201 (177-241)	345 (324-376)	469 (407-592)	946
All Hispanics (2011 - 2012)	122 (104-143)	129 (114-148)	216 (173-251)	286 (251-410)	412 (302-771)	566
All Hispanics (2013 - 2014)	113 (102-126)	117 (98.3-137)	209 (183-236)	322 (286-346)	390 (345-451)	684
Asians (2011 - 2012)	103 (91.3-115)	108 (95.9-123)	177 (153-215)	284 (237-335)	380 (296-505)	341
Asians (2013 - 2014)	78.3 (63.8-96.1)	91.1 (79.4-106)	152 (135-165)	232 (194-266)	284 (236-463)	274

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 12.0 and 12.0, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Urinary Mandelic acid (creatinine corrected) (2005 – 2006)

CAS Number 90-64-2, 611-71-2 (R), 17199-29-0 (S)

Metabolite of Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	140 (135-145)	135 (130-139)	200 (191-210)	325 (296-353)	459 (417-497)	3332
Age 12-19 years (2005 - 2006)	107 (103-111)	105 (102-108)	143 (138-151)	202 (181-228)	257 (225-289)	1028
Age 20+ years (2005 - 2006)	146 (140-152)	140 (135-145)	212 (200-220)	343 (318-380)	476 (431-527)	2303
Males (2005 - 2006)	134 (128-141)	127 (123-133)	199 (181-213)	316 (277-380)	467 (383-576)	1584
Females (2005 - 2006)	145 (140-151)	141 (136-145)	202 (188-216)	329 (312-347)	454 (418-478)	1748
Mexican Americans (2005 - 2006)	127 (120-135)	126 (122-132)	184 (162-205)	262 (233-314)	404 (285-493)	816
Non-Hispanic blacks (2005 - 2006)	118 (110-128)	117 (108-124)	178 (167-194)	282 (234-338)	377 (309-467)	896
Non-Hispanic whites (2005 - 2006)	145 (138-153)	138 (132-146)	208 (190-223)	335 (308-390)	476 (426-540)	1364

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary Mandelic acid (creatinine corrected) (2011 – 2014)

CAS Number 90-64-2, 611-71-2 (R), 17199-29-0 (S)

Metabolite of Styrene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	141 (131-151)	133 (123-142)	195 (182-212)	308 (281-335)	434 (373-512)	2464
Total population (2013 - 2014)	129 (115-143)	126 (113-143)	193 (178-208)	307 (284-347)	414 (375-466)	2540
Age 6-11 years (2011 - 2012)	133 (124-144)	136 (126-147)	186 (168-207)	244 (213-260)	283 (248-329)	393
Age 6-11 years (2013 - 2014)	130 (112-151)	137 (118-161)	192 (165-228)	274 (236-315)	322 (284-375)	380
Age 12-19 years (2011 - 2012)	107 (97.3-117)	104 (94.4-114)	146 (124-166)	191 (181-197)	248 (191-275)	384
Age 12-19 years (2013 - 2014)	97.8 (87.6-109)	104 (90.4-112)	134 (123-145)	186 (157-229)	229 (183-339)	430
Age 20+ years (2011 - 2012)	147 (137-159)	137 (125-151)	208 (190-229)	335 (308-367)	480 (407-531)	1687
Age 20+ years (2013 - 2014)	134 (119-150)	131 (118-148)	202 (186-224)	333 (294-381)	451 (400-529)	1730
Males (2011 - 2012)	135 (126-143)	124 (116-134)	187 (161-210)	294 (266-334)	408 (358-480)	1250
Males (2013 - 2014)	119 (107-133)	118 (107-130)	173 (161-189)	295 (244-333)	400 (339-451)	1262
Females (2011 - 2012)	147 (133-162)	140 (126-155)	206 (186-238)	325 (282-357)	449 (347-531)	1214
Females (2013 - 2014)	138 (122-156)	140 (122-155)	215 (192-235)	325 (284-373)	462 (367-628)	1278
Mexican Americans (2011 - 2012)	136 (119-154)	125 (113-141)	174 (158-186)	246 (220-281)	334 (244-557)	313
Mexican Americans (2013 - 2014)	128 (117-140)	124 (118-134)	179 (164-199)	296 (236-333)	371 (295-536)	443
Non-Hispanic blacks (2011 - 2012)	123 (114-132)	119 (108-131)	163 (152-179)	250 (227-287)	369 (292-419)	662
Non-Hispanic blacks (2013 - 2014)	118 (106-132)	108 (99.2-123)	179 (154-214)	320 (278-359)	425 (352-486)	537
Non-Hispanic whites (2011 - 2012)	145 (132-159)	136 (121-155)	208 (188-240)	329 (301-383)	480 (384-556)	808
Non-Hispanic whites (2013 - 2014)	132 (116-150)	130 (115-151)	196 (179-224)	319 (276-375)	434 (375-529)	945
All Hispanics (2011 - 2012)	137 (124-150)	128 (120-138)	177 (160-195)	260 (222-295)	337 (276-465)	566
All Hispanics (2013 - 2014)	126 (114-140)	124 (116-132)	186 (165-203)	295 (233-339)	391 (302-536)	684
Asians (2011 - 2012)	137 (128-148)	134 (124-147)	190 (173-200)	249 (213-318)	332 (257-465)	341
Asians (2013 - 2014)	121 (103-142)	126 (110-143)	190 (156-227)	291 (238-324)	333 (291-356)	274

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Styrene_BiomonitoringSummary.html

Factsheet: https://www.cdc.gov/biomonitoring/Styrene_FactSheet.html

Urinary N-Acetyl-S-(trichlorovinyl)-L-cysteine (2005 – 2006)

CAS Number 111348-61-9

Metabolite of Tetrachloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2313
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	902
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 3.0.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(trichlorovinyl)-L-cysteine (2011 – 2014)

CAS Number 111348-61-9

Metabolite of Tetrachloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2466
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2619
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	394
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	395
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	446
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1688
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1778
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1251
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1302
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1215
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1317
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	450
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	572
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	958
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	696
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	289

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 3.0 and 3.0, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(trichlorovinyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 111348-61-9

Metabolite of Tetrachloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2312
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(trichlorovinyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 111348-61-9

Metabolite of Tetrachloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2464
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2618
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	395
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	446
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1687
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1777
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1250
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1301
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1214
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1317
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	450
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	572
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	957
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	696
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	289

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(benzyl)-L-cysteine (2005 – 2006)

CAS Number 19542-77-9

Metabolite of Toluene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	6.80 (6.43-7.20)	6.81 (6.14-7.39)	12.8 (11.8-13.8)	24.0 (22.5-26.4)	39.8 (36.6-42.0)	3347
Age 12-19 years (2005 - 2006)	7.54 (6.60-8.62)	7.70 (6.87-8.94)	13.5 (11.8-15.3)	23.9 (19.7-30.8)	38.9 (28.3-50.0)	1032
Age 20+ years (2005 - 2006)	6.69 (6.34-7.06)	6.67 (5.95-7.30)	12.6 (11.5-13.7)	24.0 (22.6-26.3)	40.1 (35.5-43.0)	2309
Males (2005 - 2006)	7.10 (6.63-7.61)	6.93 (6.16-7.59)	12.7 (11.5-14.0)	23.8 (21.5-26.9)	38.7 (31.1-43.0)	1589
Females (2005 - 2006)	6.53 (6.02-7.08)	6.66 (5.83-7.33)	12.8 (11.7-13.8)	24.3 (21.2-27.8)	41.3 (34.0-47.7)	1753
Mexican Americans (2005 - 2006)	7.59 (6.72-8.57)	7.69 (6.61-8.53)	13.9 (12.1-15.9)	23.8 (21.0-29.3)	38.7 (29.9-50.7)	820
Non-Hispanic blacks (2005 - 2006)	11.3 (10.2-12.6)	11.4 (10.2-12.8)	22.7 (19.9-24.1)	41.8 (36.7-48.1)	64.6 (50.9-76.4)	899
Non-Hispanic whites (2005 - 2006)	6.15 (5.79-6.53)	6.05 (5.55-6.71)	11.4 (10.7-12.3)	20.0 (18.3-22.9)	34.0 (28.2-39.8)	1369

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 0.5.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Toluene_BiomonitoringSummary.html

Urinary N-Acetyl-S-(benzyl)-L-cysteine (2011 – 2014)

CAS Number 19542-77-9

Metabolite of Toluene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	6.47 (6.12-6.83)	6.45 (6.01-6.88)	12.3 (10.9-13.7)	23.6 (20.4-27.2)	37.9 (32.1-45.9)	2466
Total population (2013 - 2014)	6.19 (5.63-6.79)	6.12 (5.49-6.64)	11.9 (11.0-13.5)	25.7 (22.8-28.1)	39.2 (36.7-42.5)	2622
Age 6-11 years (2011 - 2012)	6.11 (5.37-6.96)	6.63 (5.60-7.34)	11.4 (9.82-14.2)	23.1 (16.9-25.3)	29.7 (24.9-48.2)	394
Age 6-11 years (2013 - 2014)	5.90 (4.96-7.02)	6.04 (4.85-7.12)	11.5 (8.69-15.4)	21.8 (17.5-26.7)	30.0 (21.8-47.4)	396
Age 12-19 years (2011 - 2012)	6.51 (5.53-7.65)	6.66 (5.73-7.56)	12.8 (10.1-16.9)	23.2 (17.8-33.4)	36.5 (23.9-66.0)	384
Age 12-19 years (2013 - 2014)	5.96 (5.04-7.04)	5.53 (4.63-6.59)	11.3 (9.76-13.9)	21.2 (16.0-27.4)	32.4 (21.9-38.4)	446
Age 20+ years (2011 - 2012)	6.50 (6.02-7.02)	6.31 (5.84-7.01)	12.3 (10.5-14.7)	23.7 (20.1-28.4)	38.7 (31.9-53.9)	1688
Age 20+ years (2013 - 2014)	6.25 (5.62-6.96)	6.24 (5.52-6.71)	12.2 (11.0-13.8)	27.0 (24.2-31.7)	40.8 (38.2-50.0)	1780
Males (2011 - 2012)	6.81 (6.34-7.31)	6.83 (6.09-7.65)	12.5 (11.1-14.0)	23.6 (19.3-29.8)	39.7 (29.9-62.7)	1251
Males (2013 - 2014)	5.80 (5.17-6.51)	5.90 (5.29-6.44)	10.7 (9.43-12.0)	22.2 (17.8-25.7)	37.1 (28.5-42.7)	1305
Females (2011 - 2012)	6.15 (5.56-6.82)	6.15 (5.77-6.64)	12.1 (9.98-14.5)	23.2 (19.5-28.7)	35.4 (29.7-53.9)	1215
Females (2013 - 2014)	6.59 (6.00-7.23)	6.36 (5.39-7.17)	13.8 (11.6-15.8)	30.1 (24.0-35.0)	40.8 (36.7-55.0)	1317
Mexican Americans (2011 - 2012)	5.76 (4.82-6.87)	5.87 (5.02-6.50)	9.68 (7.99-12.3)	19.1 (15.9-23.6)	29.9 (19.1-42.8)	313
Mexican Americans (2013 - 2014)	6.64 (5.75-7.67)	6.81 (5.86-7.36)	11.7 (9.72-14.7)	22.2 (17.3-30.5)	33.4 (22.5-54.6)	449
Non-Hispanic blacks (2011 - 2012)	11.0 (10.1-11.9)	10.6 (9.57-11.9)	21.6 (17.8-24.8)	39.7 (34.2-45.5)	68.3 (52.3-95.4)	662
Non-Hispanic blacks (2013 - 2014)	10.8 (9.58-12.2)	9.91 (9.03-11.1)	21.4 (16.7-26.4)	40.3 (37.1-57.5)	83.5 (59.9-97.2)	568
Non-Hispanic whites (2011 - 2012)	5.90 (5.57-6.25)	5.92 (5.35-6.47)	10.9 (10.0-12.1)	19.5 (17.7-23.2)	32.1 (25.3-39.3)	810
Non-Hispanic whites (2013 - 2014)	5.54 (4.81-6.39)	5.37 (4.77-6.26)	10.7 (8.96-12.6)	22.3 (18.9-27.1)	38.2 (27.4-45.7)	968
All Hispanics (2011 - 2012)	6.52 (5.53-7.70)	6.17 (5.50-7.39)	12.2 (9.53-15.4)	23.2 (18.3-31.6)	39.1 (24.7-56.9)	566
All Hispanics (2013 - 2014)	6.71 (6.06-7.43)	6.81 (6.21-7.26)	11.8 (10.2-13.8)	22.5 (18.7-28.3)	35.4 (26.8-50.5)	697
Asians (2011 - 2012)	5.25 (4.39-6.28)	5.30 (4.17-6.82)	10.8 (8.50-12.9)	20.5 (16.9-26.1)	35.8 (23.1-51.5)	341
Asians (2013 - 2014)	5.10 (4.41-5.91)	5.20 (4.56-6.06)	9.22 (7.25-11.6)	18.4 (14.2-29.9)	32.6 (19.1-37.3)	285

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.5 and 0.5, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Toluene_BiomonitoringSummary.html

Urinary N-Acetyl-S-(benzyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 19542-77-9

Metabolite of Toluene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	6.82 (6.56-7.08)	6.20 (5.90-6.64)	10.5 (9.92-11.2)	19.3 (17.5-21.0)	32.3 (28.9-35.9)	3331
Age 12-19 years (2005 - 2006)	5.78 (5.43-6.16)	5.46 (5.03-5.91)	9.02 (8.25-10.0)	14.9 (12.7-17.3)	20.6 (16.6-29.9)	1027
Age 20+ years (2005 - 2006)	7.00 (6.70-7.31)	6.39 (5.96-6.89)	10.7 (10.3-11.4)	19.7 (18.3-22.1)	33.7 (29.3-38.4)	2303
Males (2005 - 2006)	5.81 (5.50-6.15)	5.39 (5.14-5.75)	8.85 (8.29-9.65)	15.3 (13.7-16.5)	22.1 (19.4-27.6)	1583
Females (2005 - 2006)	7.94 (7.52-8.38)	7.39 (6.81-7.90)	12.4 (11.4-13.8)	23.7 (21.3-26.5)	38.6 (33.6-45.9)	1747
Mexican Americans (2005 - 2006)	6.81 (6.23-7.44)	6.48 (5.88-7.00)	10.6 (9.58-11.6)	17.0 (15.8-20.8)	28.9 (19.7-36.0)	816
Non-Hispanic blacks (2005 - 2006)	7.81 (6.98-8.74)	7.81 (6.82-8.70)	13.4 (12.1-14.8)	25.3 (21.0-28.5)	36.9 (28.9-51.7)	896
Non-Hispanic whites (2005 - 2006)	6.63 (6.37-6.91)	6.02 (5.67-6.57)	10.1 (9.33-10.8)	17.8 (15.8-20.1)	28.7 (23.3-36.2)	1364

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Toluene_BiomonitoringSummary.html

Urinary N-Acetyl-S-(benzyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 19542-77-9

Metabolite of Toluene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	7.39 (7.07-7.72)	6.68 (6.36-7.00)	12.2 (11.1-13.1)	21.0 (19.3-23.9)	36.4 (29.2-44.7)	2464
Total population (2013 - 2014)	7.14 (6.45-7.89)	6.58 (5.94-7.27)	11.9 (10.9-13.3)	24.6 (21.3-28.8)	37.9 (32.5-47.0)	2621
Age 6-11 years (2011 - 2012)	8.78 (8.11-9.50)	7.88 (7.00-8.46)	12.8 (11.8-14.1)	24.5 (18.2-29.5)	33.1 (23.7-56.4)	393
Age 6-11 years (2013 - 2014)	8.80 (7.42-10.4)	8.00 (6.49-9.87)	14.4 (11.8-18.6)	24.0 (19.3-29.7)	34.2 (24.3-62.8)	396
Age 12-19 years (2011 - 2012)	6.34 (5.51-7.29)	5.73 (4.72-6.94)	10.0 (8.30-12.3)	17.4 (13.3-20.2)	25.7 (17.7-32.4)	384
Age 12-19 years (2013 - 2014)	5.37 (4.86-5.93)	4.86 (4.41-5.71)	8.35 (7.32-9.65)	13.8 (12.0-18.3)	20.3 (16.7-26.5)	446
Age 20+ years (2011 - 2012)	7.42 (6.98-7.89)	6.70 (6.23-7.24)	12.5 (11.1-13.7)	21.9 (19.1-25.1)	39.4 (30.1-49.1)	1687
Age 20+ years (2013 - 2014)	7.28 (6.52-8.12)	6.77 (6.03-7.37)	12.4 (11.2-14.0)	26.0 (22.5-31.6)	44.1 (35.2-50.8)	1779
Males (2011 - 2012)	6.40 (6.04-6.78)	5.78 (5.41-6.09)	9.52 (8.74-10.5)	17.7 (15.3-21.7)	29.5 (21.3-39.6)	1250
Males (2013 - 2014)	5.81 (5.21-6.49)	5.34 (4.84-5.97)	9.23 (8.25-10.5)	18.1 (14.8-22.9)	27.9 (22.9-33.0)	1304
Females (2011 - 2012)	8.49 (7.86-9.17)	7.62 (7.11-8.30)	14.2 (12.7-15.5)	24.7 (22.2-27.0)	40.4 (31.4-49.1)	1214
Females (2013 - 2014)	8.71 (7.80-9.73)	7.78 (7.20-8.73)	15.2 (13.1-17.2)	31.2 (25.7-37.2)	50.3 (38.2-61.6)	1317
Mexican Americans (2011 - 2012)	6.50 (5.31-7.96)	5.99 (4.63-8.22)	10.4 (8.29-12.9)	17.9 (12.9-23.5)	24.1 (20.0-30.6)	313
Mexican Americans (2013 - 2014)	7.58 (6.69-8.59)	7.00 (5.80-7.86)	11.8 (10.5-13.9)	23.5 (18.1-27.9)	34.2 (25.9-60.3)	449
Non-Hispanic blacks (2011 - 2012)	8.56 (7.91-9.26)	7.73 (6.92-8.43)	14.4 (13.0-15.8)	26.0 (22.5-31.9)	46.9 (31.9-63.2)	662
Non-Hispanic blacks (2013 - 2014)	8.27 (7.26-9.42)	7.59 (6.25-8.69)	14.4 (12.6-16.8)	28.3 (23.7-32.5)	46.6 (35.0-60.5)	568
Non-Hispanic whites (2011 - 2012)	7.21 (6.86-7.58)	6.49 (5.91-6.98)	11.8 (10.0-13.1)	19.7 (17.3-24.5)	37.9 (25.7-50.1)	808
Non-Hispanic whites (2013 - 2014)	6.80 (5.96-7.77)	6.33 (5.38-7.24)	11.4 (9.85-13.4)	24.0 (18.3-31.2)	37.2 (30.6-50.1)	967
All Hispanics (2011 - 2012)	7.30 (6.38-8.36)	6.67 (5.87-7.70)	11.4 (10.2-12.9)	21.9 (19.1-24.4)	30.4 (24.6-35.3)	566
All Hispanics (2013 - 2014)	7.49 (6.85-8.19)	6.95 (5.97-7.71)	12.0 (10.7-13.9)	24.2 (19.6-29.0)	34.2 (30.2-48.1)	697
Asians (2011 - 2012)	7.02 (6.14-8.04)	6.59 (5.74-7.97)	11.9 (10.3-13.8)	24.6 (17.9-30.1)	35.5 (27.0-63.6)	341
Asians (2013 - 2014)	7.97 (6.59-9.65)	7.46 (5.87-8.74)	12.8 (10.1-18.6)	25.1 (18.6-31.6)	37.2 (26.5-60.0)	285

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Toluene_BiomonitoringSummary.html

Urinary N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine (2005 – 2006)

CAS Number 2148-31-4

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2313
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	902
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 12.6.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine (2011 – 2014)

CAS Number 2148-31-4

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2466
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2475
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	394
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	378
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	424
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1688
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1673
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1251
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1232
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1215
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1243
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	427
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	559
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	874
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	669
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	279

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 12.6 and 12.6, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 2148-31-4

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2312
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 2148-31-4

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2464
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2474
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	378
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	424
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1687
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1672
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1250
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1231
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1214
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1243
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	427
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	559
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	873
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	669
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	279

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine (2005 – 2006)

CAS Number 126543-43-9

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2313
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	902
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 4.7.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine (2011 – 2014)

CAS Number 126543-43-9

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2466
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2551
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	394
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	381
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	436
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1688
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1734
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1251
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1275
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1215
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1276
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	443
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	544
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	942
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	283

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 4.7 and 4.7, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 126543-43-9

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2312
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine (creatinine corrected) (2011 – 2014)

CAS Number 126543-43-9

Metabolite of Trichloroethene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2464
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2550
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	381
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	436
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1687
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1733
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1250
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1274
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1214
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1276
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	443
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	544
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	941
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	283

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/HalogenatedSolvents_BiomonitoringSummary.html

Urinary N-Acetyl-S-(dimethylphenyl)-L-cysteine (2005 – 2006)

CAS Number 126543-43-9

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2313
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	902
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 0.5.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary N-Acetyl-S-(dimethylphenyl)-L-cysteine (2011 – 2014)**

CAS Number 126543-43-9

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2466
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2471
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	394
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	368
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	414
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1688
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1689
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1251
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1225
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1215
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1246
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	442
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	515
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	810
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	910
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	271

**Concentrations of N-Acetyl-S-(2,4-dimethylphenyl) + (2,5-dimethylphenyl) + (3,4-dimethylphenyl)-L-cysteine were measured together and are reported as N-Acetyl-S-(dimethylphenyl)-L-cysteine.

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 0.5 and 0.5, respectively.

< LOD means less than the limit of detection, which may vary for some chemicals by year and by individual sample.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary N-Acetyl-S-(dimethylphenyl)-L-cysteine (creatinine corrected) (2005 – 2006)

CAS Number 126543-43-9

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	3349
Age 12-19 years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1036
Age 20+ years (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	2312
Males (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1592
Females (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1757
Mexican Americans (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	822
Non-Hispanic blacks (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	901
Non-Hispanic whites (2005 - 2006)	*	< LOD	< LOD	< LOD	< LOD	1371

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary N-Acetyl-S-(dimethylphenyl)-L-cysteine (creatinine corrected) (2011 – 2014)**

CAS Number 126543-43-9

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	2464
Total population (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	2470
Age 6-11 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	393
Age 6-11 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	368
Age 12-19 years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	384
Age 12-19 years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	414
Age 20+ years (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1687
Age 20+ years (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1688
Males (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1250
Males (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1224
Females (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	1214
Females (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	1246
Mexican Americans (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	313
Mexican Americans (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	442
Non-Hispanic blacks (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	662
Non-Hispanic blacks (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	515
Non-Hispanic whites (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	808
Non-Hispanic whites (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	909
All Hispanics (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	566
All Hispanics (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	683
Asians (2011 - 2012)	*	< LOD	< LOD	< LOD	< LOD	341
Asians (2013 - 2014)	*	< LOD	< LOD	< LOD	< LOD	271

**Concentrations of N-Acetyl-S-(2,4-dimethylphenyl) + (2,5-dimethylphenyl) + (3,4-dimethylphenyl)-L-cysteine were measured together and are reported as N-Acetyl-S-(dimethylphenyl)-L-cysteine.

< LOD means less than the limit of detection for the urine levels not corrected for creatinine.

* Not calculated: proportion of results below limit of detection was too high to provide a valid result.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 2-Methylhippuric acid (2005 – 2006)

CAS Number 42013-20-7

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	34.6 (31.8-37.7)	32.3 (28.3-36.7)	81.5 (70.1-91.0)	170 (155-181)	258 (221-284)	3346
Age 12-19 years (2005 - 2006)	38.1 (33.7-43.1)	35.1 (30.1-41.4)	85.6 (72.5-93.0)	183 (167-206)	277 (217-312)	1031
Age 20+ years (2005 - 2006)	34.1 (31.1-37.5)	31.8 (27.9-36.2)	81.1 (68.0-92.0)	165 (148-179)	252 (217-284)	2312
Males (2005 - 2006)	41.0 (37.5-44.8)	39.9 (35.3-44.4)	92.9 (84.6-99.8)	187 (169-207)	276 (234-306)	1588
Females (2005 - 2006)	29.5 (26.6-32.6)	26.9 (23.7-30.0)	66.7 (56.1-80.9)	156 (126-172)	235 (181-275)	1755
Mexican Americans (2005 - 2006)	32.3 (28.4-36.8)	30.2 (27.0-35.0)	67.3 (54.1-85.2)	152 (102-238)	258 (162-336)	819
Non-Hispanic blacks (2005 - 2006)	36.0 (31.9-40.7)	33.3 (28.3-40.4)	82.1 (69.0-96.1)	172 (140-193)	257 (210-280)	901
Non-Hispanic whites (2005 - 2006)	35.6 (32.4-39.1)	33.9 (28.7-38.2)	84.5 (73.0-92.9)	173 (158-196)	269 (226-293)	1368

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 5.0.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 2-Methylhippuric acid (2011 – 2014)

CAS Number 42013-20-7

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	32.8 (29.8-36.1)	30.4 (27.4-34.1)	76.1 (69.2-88.9)	161 (133-192)	221 (195-276)	2466
Total population (2013 - 2014)	28.7 (25.4-32.3)	29.0 (24.9-32.9)	69.7 (59.6-79.1)	138 (122-152)	194 (173-221)	2370
Age 6-11 years (2011 - 2012)	21.9 (19.6-24.4)	19.4 (16.6-23.4)	45.4 (35.8-54.9)	97.4 (61.8-114)	122 (97.2-168)	394
Age 6-11 years (2013 - 2014)	16.3 (13.8-19.1)	16.5 (12.7-21.3)	34.6 (29.0-39.5)	55.5 (41.6-76.7)	79.2 (59.9-129)	355
Age 12-19 years (2011 - 2012)	31.0 (26.4-36.4)	27.7 (24.7-34.5)	68.3 (56.7-75.9)	146 (104-166)	173 (161-227)	384
Age 12-19 years (2013 - 2014)	28.0 (23.6-33.2)	29.6 (23.8-35.0)	59.3 (51.4-74.8)	95.6 (81.6-117)	153 (95.6-241)	405
Age 20+ years (2011 - 2012)	34.6 (30.9-38.6)	32.8 (28.6-37.2)	83.2 (72.6-94.5)	170 (134-206)	232 (200-327)	1688
Age 20+ years (2013 - 2014)	30.4 (26.7-34.7)	30.3 (26.0-36.1)	75.7 (64.6-88.2)	149 (134-161)	208 (187-233)	1610
Males (2011 - 2012)	37.7 (32.3-44.0)	33.0 (28.5-38.9)	86.8 (72.9-104)	180 (147-224)	269 (195-407)	1251
Males (2013 - 2014)	31.8 (27.8-36.4)	32.0 (27.8-36.4)	74.7 (63.4-84.3)	148 (131-159)	208 (182-233)	1199
Females (2011 - 2012)	28.6 (25.3-32.4)	28.5 (25.4-32.5)	69.2 (58.5-82.6)	135 (113-151)	197 (159-227)	1215
Females (2013 - 2014)	25.8 (22.2-30.0)	25.8 (21.0-30.6)	64.0 (55.0-77.0)	126 (102-152)	185 (152-236)	1171
Mexican Americans (2011 - 2012)	30.5 (24.7-37.7)	29.1 (24.9-34.1)	62.3 (51.0-72.0)	129 (84.1-171)	198 (133-250)	313
Mexican Americans (2013 - 2014)	24.1 (19.5-29.7)	22.4 (18.7-26.1)	44.3 (35.6-62.6)	117 (58.6-156)	156 (117-270)	365
Non-Hispanic blacks (2011 - 2012)	35.6 (31.2-40.6)	33.0 (28.2-40.7)	78.4 (66.9-97.5)	155 (131-192)	212 (181-269)	662
Non-Hispanic blacks (2013 - 2014)	31.4 (28.0-35.3)	31.9 (27.7-39.4)	74.1 (60.4-96.8)	153 (137-168)	191 (160-260)	537
Non-Hispanic whites (2011 - 2012)	33.5 (30.0-37.3)	31.5 (27.5-35.9)	82.6 (70.5-94.5)	166 (134-204)	232 (188-351)	810
Non-Hispanic whites (2013 - 2014)	30.0 (25.7-35.0)	30.5 (26.0-36.1)	75.5 (63.8-88.2)	145 (126-164)	216 (182-241)	911
All Hispanics (2011 - 2012)	29.2 (25.0-34.1)	26.5 (22.5-32.3)	64.9 (51.0-72.7)	131 (92.5-166)	198 (144-227)	566
All Hispanics (2013 - 2014)	25.6 (21.7-30.1)	23.8 (20.2-30.6)	53.0 (42.6-69.2)	108 (75.9-140)	144 (123-189)	572
Asians (2011 - 2012)	26.2 (21.5-32.0)	26.3 (20.9-33.8)	56.4 (47.4-75.4)	114 (79.4-155)	165 (126-195)	341
Asians (2013 - 2014)	18.5 (14.2-24.0)	16.2 (11.6-23.2)	38.5 (26.9-67.9)	103 (55.2-171)	171 (88.9-256)	257

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 5.0 and 5.0, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 2-Methylhippuric acid (creatinine corrected) (2005 – 2006)

CAS Number 42013-20-7

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	34.7 (31.8-37.9)	32.4 (29.8-35.5)	74.9 (65.3-83.6)	145 (129-163)	204 (184-227)	3332
Age 12-19 years (2005 - 2006)	29.2 (26.1-32.7)	27.6 (23.0-33.3)	64.7 (56.3-74.2)	140 (118-156)	185 (160-210)	1027
Age 20+ years (2005 - 2006)	35.7 (32.4-39.3)	33.0 (30.0-36.4)	77.3 (65.3-85.3)	147 (129-168)	210 (184-230)	2305
Males (2005 - 2006)	33.6 (30.2-37.3)	32.4 (29.8-35.6)	70.2 (65.3-77.9)	133 (120-156)	193 (175-215)	1584
Females (2005 - 2006)	35.9 (32.4-39.7)	32.4 (28.5-36.9)	79.0 (64.1-90.5)	152 (132-183)	220 (184-259)	1748
Mexican Americans (2005 - 2006)	29.0 (26.2-32.0)	27.7 (24.1-29.5)	53.0 (47.0-57.8)	117 (77.6-154)	166 (123-210)	816
Non-Hispanic blacks (2005 - 2006)	24.8 (22.8-27.0)	22.5 (20.6-25.8)	51.2 (44.5-59.2)	99.4 (83.1-113)	136 (119-153)	896
Non-Hispanic whites (2005 - 2006)	38.4 (34.9-42.2)	36.5 (32.9-41.7)	83.0 (73.9-95.5)	157 (140-180)	217 (193-236)	1365

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 2-Methylhippuric acid (creatinine corrected) (2011 – 2014)

CAS Number 42013-20-7

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	37.5 (33.9-41.4)	35.2 (31.5-39.3)	77.9 (69.0-87.6)	159 (140-184)	248 (187-303)	2464
Total population (2013 - 2014)	32.9 (28.7-37.7)	33.0 (27.8-38.4)	72.3 (63.2-83.2)	140 (121-163)	213 (170-283)	2369
Age 6-11 years (2011 - 2012)	31.2 (27.5-35.3)	26.9 (24.1-31.9)	48.5 (44.9-61.0)	101 (70.9-155)	173 (102-209)	393
Age 6-11 years (2013 - 2014)	24.2 (19.3-30.5)	22.1 (18.6-26.6)	40.7 (30.1-58.0)	86.4 (41.6-263)	134 (63.3-282)	355
Age 12-19 years (2011 - 2012)	30.2 (25.4-35.9)	29.6 (22.7-38.6)	54.5 (47.6-68.9)	103 (74.3-160)	175 (106-277)	384
Age 12-19 years (2013 - 2014)	25.2 (21.0-30.2)	23.1 (17.2-31.6)	51.5 (40.5-63.8)	117 (75.7-145)	163 (121-210)	405
Age 20+ years (2011 - 2012)	39.5 (35.5-43.9)	37.4 (33.6-42.1)	87.0 (77.3-96.9)	168 (142-201)	270 (190-331)	1687
Age 20+ years (2013 - 2014)	35.3 (30.7-40.5)	36.4 (31.2-41.0)	77.8 (68.7-94.1)	145 (122-183)	223 (174-299)	1609
Males (2011 - 2012)	35.5 (30.8-40.8)	34.3 (28.6-39.8)	75.0 (62.5-86.4)	144 (121-171)	251 (161-336)	1250
Males (2013 - 2014)	32.0 (28.5-36.0)	31.2 (27.3-36.9)	68.7 (58.1-79.3)	138 (118-158)	215 (158-290)	1198
Females (2011 - 2012)	39.5 (35.2-44.2)	36.4 (31.2-41.1)	83.7 (69.0-97.2)	170 (146-198)	245 (187-301)	1214
Females (2013 - 2014)	33.7 (28.0-40.7)	34.1 (26.1-44.4)	75.8 (64.3-94.3)	142 (119-177)	213 (155-294)	1171
Mexican Americans (2011 - 2012)	34.5 (27.7-42.9)	29.3 (24.1-36.1)	62.9 (49.1-76.1)	127 (88.8-175)	188 (109-300)	313
Mexican Americans (2013 - 2014)	27.4 (23.3-32.2)	25.0 (19.9-30.1)	56.4 (39.9-68.7)	103 (82.1-144)	186 (103-304)	365
Non-Hispanic blacks (2011 - 2012)	27.7 (24.7-31.1)	26.2 (20.8-32.6)	58.9 (49.8-71.3)	104 (87.5-120)	146 (114-182)	662
Non-Hispanic blacks (2013 - 2014)	23.8 (20.8-27.1)	25.3 (20.7-27.2)	52.7 (47.6-59.7)	96.6 (76.2-112)	129 (100-181)	537
Non-Hispanic whites (2011 - 2012)	40.9 (36.9-45.4)	39.4 (34.3-43.6)	88.3 (76.3-99.7)	180 (146-233)	281 (201-333)	808
Non-Hispanic whites (2013 - 2014)	36.8 (31.4-43.1)	38.3 (33.0-42.5)	81.4 (69.7-103)	158 (126-200)	255 (187-312)	910
All Hispanics (2011 - 2012)	32.7 (28.7-37.1)	27.6 (25.2-32.6)	60.8 (52.1-70.1)	127 (98.5-142)	170 (139-238)	566
All Hispanics (2013 - 2014)	28.0 (24.4-32.2)	25.5 (21.4-29.9)	56.6 (45.9-68.7)	110 (86.4-146)	179 (136-268)	572
Asians (2011 - 2012)	35.1 (30.4-40.5)	34.3 (27.2-39.6)	71.3 (59.3-81.0)	123 (105-161)	177 (135-215)	341
Asians (2013 - 2014)	28.8 (22.0-37.7)	26.2 (18.6-44.4)	63.4 (46.0-88.9)	121 (92.8-148)	169 (130-296)	257

Biomonitoring Summary: <https://www.cdc.gov/biomonitoring/Xylenes/BiomonitoringSummary.html>

Urinary 3- & 4-Methylhippuric acid (2005 – 2006)

CAS Number 27115-49-7, 27115-50-0

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	256 (240-274)	248 (223-270)	573 (505-654)	1220 (1140-1320)	1840 (1740-1930)	3346
Age 12-19 years (2005 - 2006)	288 (261-317)	272 (239-301)	516 (453-645)	1190 (997-1370)	1810 (1460-2220)	1033
Age 20+ years (2005 - 2006)	252 (235-270)	241 (215-267)	581 (508-675)	1230 (1120-1380)	1840 (1730-1910)	2312
Males (2005 - 2006)	307 (288-328)	281 (260-324)	685 (591-765)	1380 (1280-1560)	1900 (1810-2030)	1589
Females (2005 - 2006)	216 (198-234)	204 (179-233)	467 (400-554)	1070 (971-1160)	1780 (1500-1900)	1756
Mexican Americans (2005 - 2006)	219 (198-242)	214 (195-234)	442 (355-514)	887 (612-1240)	1300 (1010-1640)	819
Non-Hispanic blacks (2005 - 2006)	284 (252-322)	260 (228-307)	651 (539-782)	1220 (1080-1410)	1660 (1410-1900)	901
Non-Hispanic whites (2005 - 2006)	264 (245-284)	258 (226-281)	595 (524-696)	1320 (1160-1510)	1900 (1790-2080)	1369

Limit of detection (LOD, see Data Analysis section) for Survey year 05-06 is 8.0.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 3-and 4-Methylhippuric acid (2011 – 2014)

CAS Number 27115-49-7, 27115-50-0

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	221 (202-241)	212 (197-229)	563 (485-624)	1190 (1000-1410)	1710 (1520-2040)	2466
Total population (2013 - 2014)	197 (179-217)	194 (172-224)	495 (426-584)	1060 (941-1180)	1540 (1330-1780)	2628
Age 6-11 years (2011 - 2012)	152 (134-172)	136 (107-180)	311 (254-368)	616 (441-747)	889 (644-1140)	394
Age 6-11 years (2013 - 2014)	120 (96.1-149)	116 (87.8-157)	245 (188-340)	428 (335-694)	836 (428-1590)	397
Age 12-19 years (2011 - 2012)	214 (185-248)	209 (176-238)	499 (374-592)	1210 (879-1570)	1680 (1510-2100)	384
Age 12-19 years (2013 - 2014)	200 (168-236)	196 (165-238)	423 (326-557)	890 (618-1340)	1450 (884-1700)	447
Age 20+ years (2011 - 2012)	231 (209-256)	222 (206-249)	601 (523-667)	1230 (1050-1470)	1740 (1560-2050)	1688
Age 20+ years (2013 - 2014)	207 (185-233)	208 (176-246)	548 (458-630)	1130 (982-1280)	1630 (1350-2010)	1784
Males (2011 - 2012)	251 (217-290)	224 (203-264)	590 (477-708)	1340 (1050-1590)	1720 (1470-2260)	1251
Males (2013 - 2014)	214 (188-242)	208 (177-249)	498 (422-591)	1100 (929-1290)	1590 (1330-1940)	1304
Females (2011 - 2012)	195 (173-220)	202 (176-215)	547 (431-602)	1020 (866-1230)	1650 (1470-1890)	1215
Females (2013 - 2014)	182 (164-204)	176 (153-208)	475 (404-595)	1050 (914-1140)	1460 (1250-1700)	1324
Mexican Americans (2011 - 2012)	178 (141-224)	165 (118-224)	388 (288-446)	879 (569-1110)	1230 (886-2120)	313
Mexican Americans (2013 - 2014)	169 (144-199)	156 (134-177)	358 (277-488)	855 (682-1090)	1270 (1050-1400)	451
Non-Hispanic blacks (2011 - 2012)	257 (226-293)	246 (200-275)	600 (495-725)	1270 (1090-1440)	1830 (1490-2060)	662
Non-Hispanic blacks (2013 - 2014)	249 (221-281)	241 (205-274)	607 (517-693)	1180 (890-1710)	1930 (1300-2830)	571
Non-Hispanic whites (2011 - 2012)	231 (209-256)	221 (205-251)	599 (499-681)	1250 (1050-1510)	1720 (1510-2190)	810
Non-Hispanic whites (2013 - 2014)	206 (181-235)	208 (174-252)	538 (442-630)	1140 (1000-1350)	1650 (1310-2170)	968
All Hispanics (2011 - 2012)	176 (141-219)	161 (118-215)	400 (294-498)	886 (597-1230)	1290 (935-1920)	566
All Hispanics (2013 - 2014)	177 (153-205)	170 (142-197)	390 (313-542)	837 (687-976)	1200 (963-1400)	698
Asians (2011 - 2012)	141 (109-183)	128 (96.4-185)	346 (251-486)	760 (598-1030)	1160 (892-1610)	341
Asians (2013 - 2014)	103 (74.0-143)	85.2 (62.6-140)	273 (142-498)	637 (445-954)	954 (636-1340)	287

Limit of detection (LOD, see Data Analysis section) for Survey year 11-12 and 13-14 are 8.0 and 8.0, respectively.

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 3- & 4-Methylhippuric acid (creatinine corrected) (2005 – 2006)

CAS Number 27115-49-7, 27115-50-0

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2005 - 2006)	257 (240-276)	219 (204-242)	521 (468-576)	1040 (908-1140)	1440 (1260-1570)	3331
Age 12-19 years (2005 - 2006)	220 (203-239)	195 (174-223)	405 (350-458)	859 (701-922)	1120 (958-1330)	1028
Age 20+ years (2005 - 2006)	263 (244-284)	225 (206-248)	534 (479-607)	1070 (930-1180)	1480 (1290-1680)	2303
Males (2005 - 2006)	252 (233-272)	222 (199-254)	512 (451-565)	965 (864-1090)	1330 (1150-1520)	1583
Females (2005 - 2006)	262 (240-287)	217 (203-237)	525 (437-650)	1080 (933-1250)	1500 (1240-1760)	1747
Mexican Americans (2005 - 2006)	196 (184-210)	180 (168-189)	325 (290-353)	636 (528-749)	918 (664-1230)	816
Non-Hispanic blacks (2005 - 2006)	196 (177-217)	168 (154-187)	399 (326-456)	744 (616-839)	1010 (862-1160)	896
Non-Hispanic whites (2005 - 2006)	285 (264-307)	250 (221-272)	594 (515-672)	1120 (984-1240)	1520 (1310-2010)	1364

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Urinary 3-and 4-Methylhippuric acid (creatinine corrected) (2011 – 2014)

CAS Number 27115-49-7, 27115-50-0

Metabolite of Xylene

Geometric mean and selected percentiles of urine concentrations (in µg/g of creatinine) for the U.S. population from the National Health and Nutrition Examination Survey.

Categories (Survey Years)	Geometric Mean (95% conf. interval)	50th Percentile (95% conf. interval)	75th Percentile (95% conf. interval)	90th Percentile (95% conf. interval)	95th Percentile (95% conf. interval)	Sample Size
Total population (2011 - 2012)	252 (232-275)	212 (185-241)	565 (510-617)	1050 (982-1130)	1540 (1370-1690)	2464
Total population (2013 - 2014)	228 (205-255)	205 (176-234)	531 (460-600)	952 (862-1090)	1410 (1160-1600)	2627
Age 6-11 years (2011 - 2012)	218 (192-247)	189 (153-230)	302 (258-376)	603 (477-669)	911 (603-1200)	393
Age 6-11 years (2013 - 2014)	180 (138-233)	158 (126-196)	272 (184-468)	740 (348-1490)	1090 (740-1590)	397
Age 12-19 years (2011 - 2012)	208 (178-244)	175 (136-227)	459 (314-585)	812 (660-982)	1130 (864-1500)	384
Age 12-19 years (2013 - 2014)	182 (155-213)	151 (131-185)	417 (281-513)	852 (513-940)	993 (832-1250)	447
Age 20+ years (2011 - 2012)	264 (242-288)	227 (195-253)	612 (545-692)	1120 (1050-1220)	1610 (1420-1940)	1687
Age 20+ years (2013 - 2014)	242 (216-273)	227 (197-264)	580 (505-648)	1000 (890-1160)	1450 (1230-1800)	1783
Males (2011 - 2012)	236 (209-266)	197 (170-229)	511 (462-549)	930 (806-1030)	1420 (1110-1870)	1250
Males (2013 - 2014)	214 (192-238)	191 (171-215)	468 (409-537)	842 (716-1040)	1340 (1040-1730)	1303
Females (2011 - 2012)	269 (244-297)	226 (189-253)	631 (551-723)	1170 (1040-1360)	1660 (1470-1830)	1214
Females (2013 - 2014)	243 (211-280)	219 (175-275)	611 (527-690)	1000 (910-1150)	1450 (1180-1600)	1324
Mexican Americans (2011 - 2012)	201 (159-253)	144 (127-179)	415 (284-515)	798 (595-1020)	1050 (792-1920)	313
Mexican Americans (2013 - 2014)	193 (172-217)	155 (134-178)	427 (315-544)	795 (624-957)	1180 (842-1990)	451
Non-Hispanic blacks (2011 - 2012)	201 (180-223)	182 (143-219)	442 (387-496)	763 (640-856)	1030 (841-1360)	662
Non-Hispanic blacks (2013 - 2014)	190 (164-222)	167 (148-200)	413 (359-472)	806 (616-940)	1070 (934-1350)	571
Non-Hispanic whites (2011 - 2012)	283 (262-306)	245 (214-287)	648 (553-723)	1210 (1050-1360)	1690 (1470-2050)	808
Non-Hispanic whites (2013 - 2014)	255 (226-287)	234 (202-279)	623 (503-691)	1050 (884-1320)	1490 (1280-1950)	967
All Hispanics (2011 - 2012)	197 (168-230)	145 (128-175)	415 (284-492)	792 (660-942)	1040 (870-1350)	566
All Hispanics (2013 - 2014)	198 (174-224)	158 (140-181)	442 (353-544)	803 (635-983)	1180 (858-1990)	698
Asians (2011 - 2012)	189 (155-231)	159 (130-203)	447 (308-581)	767 (634-1070)	1110 (748-1380)	341
Asians (2013 - 2014)	162 (122-217)	142 (100-215)	362 (220-587)	772 (539-1090)	1090 (790-1440)	287

Biomonitoring Summary: https://www.cdc.gov/biomonitoring/Xylenes_BiomonitoringSummary.html

Appendix A. Procedure to Estimate Percentiles

Including percentiles whose estimate falls on a value that is repeated multiple times in the dataset

A common practice to calculate confidence intervals from survey data is to use large-sample normal approximations. Ninety-five percent confidence intervals on point estimates of percentiles are often computed by adding and subtracting from the point estimate a quantity equal to twice its standard error. This normal approximation method may not be adequate, however, when estimating the proportion of subjects above or below a selected value, especially when the proportion is near 0.0 or 1.0 or when the effective sample size is small. In addition, confidence intervals on proportions deviating from 0.5 are not theoretically expected to be symmetric around the point estimate. Further, adding and subtracting a multiple of the standard error to an estimate near 0.0 or 1.0 can lead to impossible confidence limits (i.e., proportion estimates below 0.0 or above 1.0). The approach used for the *Report* data tables (and for previous *Reports*) produces asymmetric confidence intervals consistent with skewed (nonnormal) biologic data distributions.

The method we use to estimate percentiles and their confidence limits for the *Report* data tables and for previous reports is adapted from a method proposed by Woodruff (1952) for percentile estimation and a method described by Korn and Graubard (1998) for estimating confidence intervals for proportions. This method essentially involves first obtaining an empirical point estimate of the desired percentile by creating a rank ordered listing of the sampled observations along with their sampling weights. From this listing and the sampling weights, it is possible to determine an empirical percentile estimate for the target population. After this point estimate of the percentile has been obtained, the fraction of results below the estimate is calculated. The fraction below the point estimate should be very close to the proportion corresponding to the desired percentile, but can deviate from this proportion depending on the frequency of non-unique sampled observations in the vicinity of the empirical percentile estimate and depending on the sampling weight associated with the sampled observation. For example, when measuring some compounds as part of NHANES there may be multiple results below a common limit of detection (LOD) or multiple results with identical measured values due to the reporting limitations of the instrument. This phenomenon coupled with the sampling weight assigned to each measured result and with the limitations of statistical software can lead to difficulties in accurately estimating some percentiles and their corresponding confidence limits because an exact percentile may fall within a large group of results with identical measured values. We circumvented this potential problem for the *Report* data tables by adding a unique, negligibly small number to each measured result. This small number was later subtracted from the percentile estimate without affecting the percentile estimate and without altering any of the original measured results.

By adding a unique, negligibly small number to each sampled observation, it was possible to associate a single sampled observation with the percentile estimate and thus to minimize the difference between the fraction below the point estimate and the proportion corresponding to the desired percentile. However, due to sample weighting, it is still possible to obtain a different point estimate (which will only differ by the difference between numerically adjacent analyte values) depending on how the data are sorted before adding the unique number to each result. We circumvented this potential problem by replacing actual sample weights with an average sample weight where the average is computed across subjects in the same demographic domain who have identical measured results. We computed standard error

estimates in a separate step using the original (unaltered) data. Clopper-Pearson 95% confidence intervals around the estimated proportion are obtained using the method described by Korn and Graubard (1998).

We describe below how SAS Proc Univariate and SUDAAN can be used to carry out this method of percentile and confidence interval estimation. SAS code for calculating these confidence intervals can be downloaded from <http://www.cdc.gov/exposurereport>. In the narrative that follows, the term 'demographic domain' refers to a demographic group of interest, for example non-Hispanic blacks. The term 'set of subsample weights' refers to the sampling weights that correspond to the variable for which percentiles will be estimated, for example the set of subsample weights associated with total blood mercury measurements. The term 'analyte' refers to the biological or chemical compound measured in a group of subjects and for which percentiles are to be estimated.

Procedure to calculate percentile estimates and their confidence intervals

Step 1: Obtain a percentile estimate using the original (unaltered data):

Create a separate file with original data (ORIG_DATA). Use SAS (SAS Institute Inc. 1999) Proc Univariate (with default percentile definition equivalent to option PCTLDEF = 5 and with the Freq option variable equal to the original subsample sampling weight) to obtain a point estimate of the percentile (PTLE_ORIG) of an analyte's original results for the demographic domain of interest, for example, the 95th percentile of total blood mercury results for adults aged 20+ years.

Step 2: Obtain a percentile estimate using the altered data:

Create a separate file for use with altered data (ALTR_DATA). Sort the data by analyte measured value separately for each particular demographic domain and set of subsample weights. Use SAS Proc Means to compute the average sampling weight (WT_{AVE}) for each unique measured result. For each unique measured result, use a counter from 1 to the total number of subjects with identical values to create a unique integer to associate with each measured observation. Each of these numbers should then be divided by 1,000,000,000 and added to the corresponding measured observation. This will result in each measured observation having an additional fractional amount beyond the fourth decimal as long as there are less than 10,000 subjects with the same measured result. Use SAS Proc Univariate (again with default percentile definition equivalent to option PCTLDEF = 5 but now with the Freq option variable equal to WT_{AVE}) to obtain a point estimate of the percentile (PTLE_ALTR) of an analyte's altered results for the demographic domain of interest.

Step 3: Sort the data in the ORIG_DATA file by the stratum (sdmvstra) and primary sampling unit (sdmvpsu) variables. Use SUDAAN (SUDAAN Users Manual, 2001) Proc Descript with Taylor Linearization DESIGN = WR (i.e., sampling with replacement), with proper NEST statement, and with the original subsample sampling weight variable to estimate the proportion (P_ORIG) of subjects with results below the percentile estimate (PTLE_ORIG) obtained in Step 1 and discard P_ORIG but retain the standard error (SEMEAN_ORIG) associated with PTLE_ORIG.

Step 4: Sort the data in the ALTR_DATA file by the stratum (sdmvstra) and primary sampling unit (sdmvpsu) variables. Use SUDAAN (SUDAAN Users Manual, 2001) Proc Descript with Taylor Linearization DESIGN = WR (i.e., sampling with replacement), with proper NEST statement, and with the average sampling weight variable (WT_{AVE}) to estimate the proportion (P_ALTR) of subjects with results below the percentile estimate (PTLE_ALTR) obtained in Step 2 and keep

P_ALTR but discard the standard error (SEMEAN_ALTR) associated with PTLE_ALTR. Compute the degrees-of-freedom adjusted effective sample size

$$(1) \quad n_{df} = ((t_{num}/t_{denom})^2)P_ALTR(1 - P_ALTR)/(SEMEAN_ORIG^2)$$

where t_{num} and t_{denom} are 0.975 critical values of the Student's t distribution with degrees of freedom equal to the actual sample size minus 1 and the number of primary sampling units (PSUs) minus the number of strata, respectively. Note: the degrees of freedom for t_{denom} can vary with the demographic domain of interest (e.g., males).

Step 5: After obtaining an estimate of P_ALTR (i.e., the proportion obtained in Step 4), compute the Clopper-Pearson 95% confidence interval ($P_L(x, n_{df})$, $P_U(x, n_{df})$) as follows:

$$(2) \quad P_L(x, n_{df}) = v_1 F_{v_1, v_2} (0.025) / (v_2 + v_1 F_{v_1, v_2} (0.025))$$

&

$$P_U(x, n_{df}) = v_3 F_{v_3, v_4} (0.975) / (v_4 + v_3 F_{v_3, v_4} (0.975))$$

where x is equal to P_ALTR times n_{df} , $v_1 = 2x$, $v_2 = 2(n_{df} - x + 1)$, $v_3 = 2(x + 1)$, $v_4 = 2(n_{df} - x)$, and $F_{d_1, d_2}(\beta)$ is the β quantile of an F distribution with d_1 and d_2 degrees of freedom. (Note: If n_{df} is greater than the actual sample size or if P_ALTR is equal to zero, then the actual sample size should be used in place of n_{df} .) This step will produce a lower and an upper limit for the estimated proportion obtained in Step 4.

Step 6: Use SAS Proc Univariate (again with default percentile definition equivalent to option PCTLDEF = 5 and with the Freq option variable equal to WT_{AVE}) to determine the analyte values that correspond to the desired percentile (proportion) and to the lower and upper proportion limits obtained in Step 5. Round these results to 2 or 3 decimals depending on the significant figures associated with the original measured values.

Example:

To estimate the 95th percentile of total blood mercury in adults 20+ years of age in the 2013-2014 survey, create two separate files: name one ORIG_DATA and the other ALTR_DATA. For the ORIG_DATA file use SAS Proc Univariate with the Freq option and the subsample sampling weight (or in this case the full sample sampling weight because total blood mercury is the analyte of interest) to get a weighted point estimate of the analyte value that corresponds to the 95th percentile (PTLE_ORIG). For this example the value is 4.88 µg/L.

Sort the results in the ALTR_DATA file by analyte measured value. Use SAS Proc Means to compute the average sampling weight (WT_{AVE}) for each unique analyte measured value. For each unique measured result, use a counter from 1 to the total number of subjects with identical values to create a unique integer to associate with each measured observation. Divide each counter value by 1,000,000,000 and add this amount to the corresponding measured observation. For this altered data file (ALTR_DATA) use SAS Proc Univariate with the Freq option and WT_{AVE} to get a weighted point estimate of the analyte value that corresponds to the 95th percentile (PTLE_ALTR). For this example the value is also 4.88 µg/L.

For the ORIG_DATA file use SUDAAN to estimate the weighted proportion (P_ORIG) of subjects with results below the value of PTLE_ORIG (which can differ from 0.95 depending on the number of results with identical values; for this example the proportion is 0.9491) and the standard error (SEMEAN_ORIG) associated with P_ORIG (for this example SEMEAN_ORIG = 0.0044).

For the ALTR_DATA file use SUDAAN to estimate the weighted proportion of subjects (P_{ALTR}) with results below the value of $PTLE_{ALTR}$ (which should also be very close to 0.95 regardless of the number of original results with identical values; for this example the proportion is also 0.9491). Then obtain a confidence interval on P_{ALTR} by computing the weighted Clopper-Pearson 95% confidence limits (equation 2 above) using the degrees-of-freedom adjusted effective sample size as described in equation 1 above. For this example the effective sample size is 2113.64 resulting in lower and upper confidence limits of 0.93885 and 0.95808, respectively. Then use SAS Proc Univariate (with the Freq option variable equal to WT_{AVE}) to determine the analyte values corresponding to the weighted 93.9th and 95.8th percentiles. These point estimates are the lower and upper confidence limits on the 95th percentile estimate. Round the 95th percentile estimate and its confidence limits to 2 or 3 decimals depending on the significant figures associated with the original measured values. For this example the rounded point estimate is 4.88 µg/L with lower and upper confidence limits of 4.36 and 5.21 µg/L, respectively.

Appendix C. Limit of Detection Table

The analytical limit of detection (LOD) for each of the different chemical measurements is presented in the table below. The LOD is the concentration at which the measurement has a 95% probability of being greater than zero (Taylor, 1987). As analytical methods improve, LODs will often change. For this reason, LOD values are reported by survey periods (e.g., 1999-2000, 2001-2002, etc.).

Reference: Taylor JK. Quality Assurance of Chemical Measurements. Chelsea (MI): Lewis Publishing. 1987.

Adducts of Hemoglobin

Chemical, in packed rbc's, pmol/g hemoglobin	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Acrylamide	--	--	3.0	0.11	--	--	--	--	--
Glycidamide	--	--	4.0	0.66	--	--	--	--	--

Tobacco Metabolites

Chemical, matrix, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Cotinine in serum, ng/mL	0.05	0.05	0.015	0.015	0.015	0.015	0.015	0.015	--
Hydroxycotinine in serum, ng/mL	--	--	--	--	--	--	--	0.015	--
NNAL in urine, pg/mL	--	--	--	--	1	0.6	0.6	--	--

Disinfection By-Products

Chemical, in blood, pg/mL	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Bromodichloromethane	--	0.233	0.62	0.620	0.620	0.620	0.620	6.00	6.00
Dibromochloromethane	--	0.271	0.62	0.620	0.620	0.620	0.620	5.00	5.00
Tribromomethane (Bromoform)	--	0.596	1.5	1.00	1.00	1.00	1.00	5.00	5.00
Trichloromethane (Chloroform)	--	2.37	2.11	2.10	2.10	2.10	2.10	8.00	8.00

Personal Care and Consumer Product Chemicals and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Benzophenone-3	--	--	0.3	0.4	0.4	0.4	0.4	0.4	--
Bisphenol A	--	--	0.4	0.4	0.4	0.4	0.4	0.2	--
Bisphenol F	--	--	--	--	--	--	--	0.2	--
Bisphenol S	--	--	--	--	--	--	--	0.1	--

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
4-tert-Octylphenol	--	--	--	0.2	0.2	0.2	--	--	--
Triclocarban	--	--	--	--	--	--	--	0.1	--
Triclosan	--	--	2.3	2.3	2.3	2.3	2.3	1.7	--
Butyl paraben	--	--	--	0.2	0.2	0.2	0.2	0.1	--
Ethyl paraben	--	--	--	1.0	1.0	1.0	1.0	1.0	--
Methyl paraben	--	--	--	1.0	1.0	1.0	1.0	1.0	--
n-Propyl paraben	--	--	--	0.2	0.2	0.2	0.2	0.1	--
2,4-Dichlorophenol	--	--	0.17	0.2	0.2	0.2	0.2	0.1	--
2,5-Dichlorophenol	--	--	0.12	0.2	0.2	0.2	0.2	0.1	--

Flame Retardant Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Bis(1-chloro-2-propyl) phosphate (BCPP)	--	--	--	--	--	--	--	0.1	--
Bis(2-chloroethyl) phosphate (BCEiP)	--	--	--	--	--	--	--	0.08	--
Bis(1,3-dichloro-2-propyl) phosphate (BDCPP)	--	--	--	--	--	--	--	0.11	--
Dibenzyl phosphate (DBzP)	--	--	--	--	--	--	--	0.05	--
Dibutyl phosphate (DBuP)	--	--	--	--	--	--	--	0.05	--
Di-o-cresylphosphate (DoCP)	--	--	--	--	--	--	--	0.05	--
Di-p-cresylphosphate (DpCP)	--	--	--	--	--	--	--	0.05	--
Diphenyl phosphate (DPHP)	--	--	--	--	--	--	--	0.16	--
2,3,4,5-Tetrabromobenzoic acid (TBBA)	--	--	--	--	--	--	--	0.05	--

Fungicides and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
ortho-Phenylphenol	--	--	0.1	0.1	0.1	0.2	--	--	--
Ethylene thiourea	--	--	0.1	0.24	0.21	--	--	--	--
Pentachlorophenol	--	--	0.5	--	--	--	--	--	--
Propylene thiourea	--	--	0.1	0.37	0.36	--	--	--	--

Herbicides and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Atrazine	--	--	--	--	0.5	--	--	--	--
Atrazine mercapturate	--	--	--	--	0.5	--	--	--	--
Desethyl atrazine	--	--	--	--	0.25	--	--	--	--
Desisopropyl atrazine	--	--	--	--	0.25	--	--	--	--
Desisopropyl atrazine mercapturate	--	--	--	--	0.1	--	--	--	--
Diaminochlorotriazine	--	--	--	--	0.5	--	--	--	--
2,4-Dichlorophenoxyacetic acid	0.952	0.2	0.1	--	0.4	0.15	--	--	--
2,4,5-Trichlorophenoxyacetic acid	1.2	0.1	0.1	--	0.10	0.1	--	--	--

Sulfonyl Urea Herbicides

Chemical in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Bensulfuron-methyl	--	--	0.05	0.05	0.05	--	--	--	--
Chlorsulfuron	--	--	0.06	0.06	0.06	--	--	--	--
Ethametsulfuron-methyl	--	--	0.1	0.1	0.1	--	--	--	--
Foramsulfuron	--	--	0.05	0.05	0.05	--	--	--	--
Halosulfuron	--	--	0.1	0.1	0.1	--	--	--	--
Mesosulfuron-methyl	--	--	0.06	0.06	0.06	--	--	--	--
Metsulfuron-methyl	--	--	0.05	0.05	0.05	--	--	--	--
Nicosulfuron	--	--	0.1	0.1	0.1	--	--	--	--
Oxasulfuron	--	--	0.06	0.06	0.06	--	--	--	--
Primisulfuron-methyl	--	--	0.07	0.07	0.07	--	--	--	--
Prosulfuron	--	--	0.05	0.05	0.05	--	--	--	--
Rimsulfuron	--	--	0.05	0.05	0.05	--	--	--	--
Sulfometuron-methyl	--	--	0.05	0.05	0.05	--	--	--	--
Sulfosulfuron	--	--	0.1	0.1	0.1	--	--	--	--
Thifensulfuron-methyl	--	--	0.08	0.08	0.08	--	--	--	--
Triasulfuron	--	--	0.07	0.07	0.07	--	--	--	--

Chemical, in urine, µg/L		1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Triflurosulfuron-methyl		--	--	0.05	0.05	0.05	--	--	--	--

Insect Repellent and Metabolites

Chemical, in urine, µg/L		1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
N,N-Diethyl- <i>meta</i> -toluamide (DEET)		--	--	--	--	0.083	0.083	0.083	0.083	--
3-(Diethylcarbamoyl) benzoic acid (DCBA)		--	--	--	--	0.93	0.475	0.475	0.475	--
N,N-Diethyl-3-(hydroxymethyl) benzamide (DHMB)		--	--	--	--	0.089	0.089	0.089	0.089	--

Carbamate Pesticide Metabolites

Chemical, in urine, µg/L		1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Carbofuranphenol		0.4	0.4	0.4	--	--	--	--	--	--
2-isopropoxyphenol		1.1	0.4	0.4	--	--	--	--	--	--

Organochlorine Pesticides and Metabolites

Chemical, in urine, µg/L		1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,4,5-Trichlorophenol		--	--	0.1	0.1	0.1	0.1	--	--	--
2,4,6-Trichlorophenol		--	--	0.5	0.5	0.5	0.5	--	--	--

Organophosphorus Insecticides: Specific Metabolites

Chemical, in urine, µg/L		1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Acephate		--	--	0.1	0.25	0.27	--	--	--	--
Dimethoate		--	--	0.1	0.25	0.1	--	--	--	--
Methamidophos		--	--	0.1	0.37	0.41	--	--	--	--
Omethoate		--	--	0.1	0.14	0.1	--	--	--	--
Malathion dicarboxylic acid		2.64	--	--	--	0.5	0.5	--	--	--
2-Isopropyl-4-methyl-pyrimidinol		7.2	0.7	--	--	0.1	0.1	--	--	--
<i>para</i> -Nitrophenol		0.8	0.1	--	--	0.1	0.1	--	--	--
3,5,6-Trichloro-2-pyridinol		0.4	0.4	--	--	0.1	0.1	--	--	--

Organophosphorus Insecticides: Dialkyl Phosphate Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Diethylphosphate (DEP)	0.2	0.2	0.1	0.37	0.37	--	--	--	--
Dimethylphosphate (DMP)	0.58	0.5	0.5	0.47	0.47	--	--	--	--
Diethylthiophosphate (DETP)	0.09	0.1	0.2	0.56	0.56	--	--	--	--
Dimethylthiophosphate (DMTP)	0.18	0.4	0.5	0.55	0.55	--	--	--	--
Diethyldithiophosphate (DEDTP)	0.05	0.1	0.1	0.39	0.39	--	--	--	--
Dimethyldithiophosphate (DMDTP)	0.08	0.1	0.1	0.51	0.51	--	--	--	--

Pyrethroid Insecticide Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
<i>trans</i> -3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid	0.1	0.1	--	--	0.6	0.6	--	--	--
<i>cis</i> -3-(2,2-Dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid	0.1	0.1	--	--	0.5	0.5	--	--	--
4-Fluoro-3-phenoxy-benzoic acid	0.2	0.2	--	--	0.1	0.1	--	--	--
3-Phenoxybenzoic acid	0.1	0.1	--	--	0.1	0.1	--	--	--

Metals and Metalloids

Chemical, matrix, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Antimony in urine, µg/L	0.04	0.04	0.07	0.032	0.032	0.032	0.041	0.022	0.022
Arsenic, Total in urine, µg/L	--	--	0.74	0.74	0.74	0.74	1.25	0.26	0.26
Arsenic (V) Acid in urine, µg As/L	--	--	1.0	1.0	1.0	1.0	0.87	0.79	0.79
Arsenobetaine in urine, µg As/L	--	--	0.4	0.4	0.4	0.4	1.19	1.16	1.16
Arsenocholine in urine, µg As/L	--	--	0.6	0.6	0.6	0.6	0.28	0.11	0.11
Arsenous (III) Acid in urine, µg As/L	--	--	1.2	1.2	1.2	1.2	0.48	0.12	0.12
Dimethylarsinic Acid in urine, µg As/L	--	--	1.7	1.7	1.7	1.7	1.8	1.91	1.91
Monomethylarsonic Acid in urine, µg As/L	--	--	0.9	0.9	0.9	0.9	0.89	0.20	0.20
Inorganic-related Arsenic Species, in urine, µg As/g	--	--	--	--	--	--	--	--	--
Trimethylarsine oxide in urine, µg As/L	--	--	1.0	1.0	1.0	1.0	0.25	--	--
Barium in urine, µg/L	0.12	0.12	0.31	0.12	0.12	0.12	0.1	0.06	0.06

Chemical, matrix, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Beryllium in urine, µg/L	0.13	0.13	0.13	0.072	0.072	0.072	--	--	--
Cadmium in blood, µg/L	0.3	0.3	0.14	0.2	0.2	0.2	0.16	0.1	0.1
Cadmium in urine, µg/L	0.06	0.06	0.06	0.042	0.042	0.042	0.056	0.036	0.036
Cesium in urine, µg/L	0.14	0.14	0.2	0.066	0.066	0.066	0.12	0.086	0.086
Chromium in blood, µg/L	--	--	--	--	--	--	--	--	0.41
Cobalt in blood, µg/L	--	--	--	--	--	--	--	--	0.6
Cobalt in urine, µg/L	0.07	0.07	0.08	0.041	0.041	0.041	0.048	0.023	0.023
Copper in serum, µg/dL	--	--	--	--	--	--	2.5	2.5	--
Lead in blood, µg/dL	0.3	0.3	0.28	0.25	0.25	0.25	0.25	0.07	0.07
Lead in urine, µg/L	0.1	0.1	0.33	0.1	0.1	0.1	0.08	0.03	0.030
Manganese in blood, µg/L	--	--	--	--	--	--	1.06	0.99	0.99
Manganese in urine, µg/L	--	--	--	--	--	--	0.08	0.13	0.130
Mercury, Total in blood, µg/L	--	--	0.2	0.33	0.33	0.33	0.16	0.28	0.28
Mercury, Inorganic in blood, µg/L	--	--	0.42	0.4	0.35	0.35	0.27	0.27	0.27
Mercury, Ethyl in blood, µg/L	--	--	--	--	--	--	0.16	0.16	0.16
Mercury, Methyl in blood, µg/L	--	--	--	--	--	--	0.12	0.12	0.12
Mercury in urine, µg/L	--	--	0.14	0.11	0.08	0.08	0.05	0.13	0.13
Molybdenum in urine, µg/L	0.8	0.8	1.5	0.92	0.92	0.92	0.99	0.80	0.800
Platinum in urine, µg/L	0.04	0.04	0.07	0.009	0.009	0.009	--	--	--
Selenium in blood, µg/L	--	--	--	--	--	--	30.0	24.5	24.5
Selenium in serum, µg/L	--	--	--	--	--	--	4.5	4.5	--
Strontium in urine, µg/L	--	--	--	--	--	--	2.5	2.34	2.340
Thallium in urine, µg/L	0.02	0.02	0.02	0.015	0.015	0.015	0.02	0.018	0.018
Tin in urine, µg/L	--	--	--	--	--	--	0.22	0.09	0.090
Tungsten in urine, µg/L	0.04	0.04	0.04	0.021	0.021	0.021	0.026	0.018	0.018
Uranium in urine, µg/L	0.004	0.004	0.005	0.002	0.002	0.0017	0.0033	0.002	0.002
Zinc in serum, µg/dL	--	--	--	--	--	--	2.9	2.9	--

Perchlorate and Other Anions in urine

Chemical, matrix, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Nitrate, mg/L	--	0.7	--	0.7	0.7	0.7	0.7	0.7	--
Perchlorate, µg/L	--	0.05	0.05	0.05	0.05	0.05	0.05	0.05	--
Thiocyanate, mg/L	--	0.02	--	0.02	0.02	0.02	0.02	0.02	--

Perfluoroalkyl and Polyfluoroalkyl Substances: Surfactants

Chemical, in serum, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Perfluorobutane sulfonic acid (PFBS)	--	--	0.4	0.1	0.1	0.1	0.1	0.1	--
Perfluorodecanoic acid (PFDA)	0.2	--	0.3	0.2	0.2	0.1	0.1	0.1	0.1
Perfluorododecanoic acid (PFDoA)	0.2	--	1	0.2	0.2	0.1	0.1	0.1	0.1
Perfluoroheptanoic acid (PFHpA)	0.4	--	0.3	0.4	0.4	0.1	0.1	0.1	--
Perfluorohexane sulfonic acid (PFHxS)	0.1	--	0.3	0.1	0.1	0.1	0.1	0.1	0.1
Perfluorononanoic acid (PFNA)	0.1	--	0.1	0.1	0.082	0.082	0.082	0.1	0.1
Perfluorooctanoic acid (PFOA)	0.1	--	0.2	0.1	0.1	0.1	0.1	--	--
n-Perfluorooctanoic acid (n-PFOA)	--	--	--	--	--	--	--	0.1	0.1
Branched Perfluorooctanoic acid isomers (Bb-PFOA)	--	--	--	--	--	--	--	0.1	0.1
Perfluorooctane sulfonic acid (PFOS)	0.2	--	0.4	0.2	0.2	0.2	0.2	--	--
n-Perfluorooctane sulfonic acid (n-PFOS)	--	--	--	--	--	--	--	0.1	0.1
Perfluoromethylheptane sulfonic acid isomers (Sm-PFOS)	--	--	--	--	--	--	--	0.1	0.1
Perfluorooctane sulfonamide (PFOSA or FOSA)	0.05	--	0.1	0.1	0.1	0.1	0.1	0.1	--
2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA)	0.2	--	0.4	0.2	0.2	0.1	0.1	0.1	--
2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA)	0.174	--	0.523	0.174	0.174	0.087	0.087	0.1	0.1
Perfluoroundecanoic acid (PFUnDA)	0.2	--	0.3	0.2	0.2	0.1	0.1	0.1	0.1

Phthalate and Phthalate Alternatives Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Mono-benzyl phthalate (MBzP)	0.576	0.216	0.072	0.216	0.216	0.216	0.3	0.3	0.3
Mono-3-hydroxybutyl phthalate (MHBP)	--	--	--	--	--	--	--	0.4	0.4

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Mono- <i>n</i> -butyl phthalate (MnBP)	0.9	1.1	0.4	0.6	0.6	0.4	0.4	0.4	0.4
Mono-isobutyl phthalate (MiBP)	--	1	0.3	0.3	0.3	0.2	0.2	0.8	0.8
Mono-2-methyl-2-hydroxypropyl phthalate (MHBP)	--	--	--	--	--	--	--	0.4	0.4
Mono-cyclohexyl phthalate (MCHP)	1.81	0.603	0.402	0.603	0.603	0.402	--	--	--
Mono-ethyl phthalate (MEP)	0.792	0.594	0.264	0.528	0.462	0.396	0.6	1.2	1.2
Mono-2-ethylhexyl phthalate (MEHP)	1.2	1	0.9	1.2	1.1	0.5	0.5	0.8	0.8
Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)	--	1	0.3	0.7	0.7	0.2	0.2	0.4	0.4
Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)	--	1.1	0.5	0.7	0.6	0.2	0.2	0.2	0.2
Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP)	--	--	0.3	0.6	0.5	0.2	0.2	0.4	0.4
Mono-(carboxynonyl) phthalate (MCNP)	--	--	--	0.6	0.5	0.2	0.2	0.2	0.2
Mono-isononyl phthalate (MiNP)	1.23	1.23	1.54	1.23	1.23	0.77	0.6	0.9	0.9
Mono-oxoisononyl phthalate (MONP)	--	--	--	--	--	--	--	--	0.4
Mono-(carboxyoctyl) phthalate (MCOP)	--	--	--	0.7	0.7	0.2	0.2	0.3	0.3
Mono-methyl phthalate (MMP)	--	0.2	1	1.1	1.1	0.5	0.5	--	--
Mono-(3-carboxypropyl) phthalate (MCP)	--	0.4	0.2	0.2	0.2	0.2	0.2	0.4	0.4
Mono- <i>n</i> -octyl phthalate (MOP)	1.51	1.68	1.68	1.85	1.85	0.84	--	--	--
Cyclohexane-1,2-dicarboxylic acid mono hydroxyisononyl ester (MHNCH)	--	--	--	--	--	--	0.4	0.4	0.4
Cyclohexane-1,2-dicarboxylic acid mono carboxyisooctyl ester (MCOCH)	--	--	--	--	--	--	--	--	0.5
Mono-2-ethyl-5-carboxypentyl terephthalate (MECPTP)	--	--	--	--	--	--	--	--	0.2
Mono-2-ethyl-5-hydroxyhexyl terephthalate (MEHHTP)	--	--	--	--	--	--	--	--	0.4

Phytoestrogens and Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Daidzein	0.5	1.6	0.3	0.4	0.4	0.4	--	--	--
Enterodiol	0.8	1.5	0.3	0.04	0.04	0.04	--	--	--
Enterolactone	0.6	1.9	0.3	0.1	0.1	0.1	--	--	--
Equol	3	3.3	0.3	0.06	0.06	0.6	--	--	--
Genistein	0.3	0.8	0.3	1	0.2	0.2	--	--	--
O-Desmethylangolensin	0.2	0.4	0.2	0.2	0.2	0.2	--	--	--

Polycyclic Aromatic Hydrocarbon Metabolites

Chemical, in urine, units	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2-Hydroxyfluorene ng/L	--	--	5.0	5.0	5.0	10.0	10.0	8.0	--
3-Hydroxyfluorene ng/L	--	2.0	5.0	5.0	5.0	10.0	10.0	8.0	--
9-Hydroxyfluorene ng/L	--	--	5.0	5.0	5.0	10.0	10.0	--	--
1-Hydroxyphenanthrene ng/L	--	3.5	5.0	5.0	5.0	10.0	10.0	9.0	--
2-Hydroxyphenanthrene ng/L	--	3.2	5.0	5.0	5.0	10.0	10.0	--	--
3-Hydroxyphenanthrene ng/L	--	3.6	5.0	5.0	5.0	10.0	10.0	--	--
2- & 3-Hydroxyphenanthrene ng/L	--	--	--	--	--	--	--	10.0	--
4-Hydroxyphenanthrene ng/L	--	--	5.0	5.0	--	--	--	--	--
1-Hydroxypyrene ng/L	--	--	5.0	5.0	5.0	10.0	10.0	70.0	--
1-Hydroxynaphthalene (1-Naphthol), µg/L	--	--	0.047	0.048	0.045	0.044	0.044	0.06	--
2-Hydroxynaphthalene (2-Naphthol), µg/L	--	0.002	0.031	0.013	0.042	0.042	0.042	0.09	--

Heterocyclic Amines

Chemical, in urine, ng/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1)	--	--	--	--	--	--	--	0.79	--
2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA-α-C)	--	--	--	--	--	--	--	0.33	--
2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (Ph1P)	--	--	--	--	--	--	--	0.34	--
2-Amino-9H-pyrido[2,3-b]indole (A-α-C)	--	--	--	--	--	--	--	0.62	--
2-Amino-3-methylimidazo[4,5-f]quinoline (IQ)	--	--	--	--	--	--	--	0.37	--
2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole (Glu-P1)	--	--	--	--	--	--	--	0.31	--
2-Aminodipyrido[1,2-a:3',2'-d]imidazole (GLU-P2)	--	--	--	--	--	--	--	0.83	--
1-Methyl-9H-pyrido[3,4-b]indole (Harman)	--	--	--	--	--	--	--	4.59	--
1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2)	--	--	--	--	--	--	--	0.63	--
9H-pyrido[3,4-b]indole (Norharman)	--	--	--	--	--	--	--	12.6	--

Volatile Organic Compounds (VOCs)

Chemical, in whole blood, ng/mL except as noted	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
1,1,1-Trichloroethane (Methyl chloroform)	--	--	0.048	0.01	0.01	0.01	0.01	0.01	0.011
1,1,1,2-Tetrachloroethane	--	--	--	--	0.04	0.04	0.04	0.04	0.040
1,1,2,2-Tetrachloroethane	--	--	0.05	0.01	0.01	0.01	0.01	--	--
1,1,1,2-Trichloroethane	--	--	0.01	0.01	0.01	0.01	0.01	--	--
1,2,3-Trichloropropane	--	--	--	--	0.04	--	--	0.04	0.040
1,1-Dichloroethane	--	--	0.01	0.01	0.01	0.01	0.01	--	--
1,1-Dichloroethene (Vinylidene chloride)	--	--	0.009	0.009	0.009	0.009	0.009	--	--
1,2-Dibromo-3-chloropropane (DBCP)	--	--	0.1	0.1	0.1	0.1	--	--	--
1,2-Dibromoethane	--	--	--	--	0.015	0.015	0.015	0.015	0.015
1,2-Dichlorobenzene (o-Dichlorobenzene)	--	--	0.1	0.1	0.025	0.025	0.025	0.025	0.025
1,2-Dichloroethane (Ethylene dichloride)	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.010
cis-1,2-Dichloroethene	--	--	0.01	0.01	0.01	0.01	0.01	--	--
trans-1,2-Dichloroethene	--	--	0.01	0.01	0.01	0.01	0.01	--	--
1,2-Dichloropropane	--	--	0.008	0.008	0.01	0.01	0.01	--	--
1,3-Dichlorobenzene	--	--	0.05	0.05	0.025	0.025	0.025	0.025	0.025
1,4-Dichlorobenzene (Paradichlorobenzene)	--	0.12	0.12	0.011	0.04	0.04	0.04	0.04	0.04
1,4-Dioxane	--	--	--	--	--	0.5	0.5	0.5	0.500
2,5-Dimethylfuran	--	--	0.012	0.011	0.011	0.011	0.011	0.011	0.011
Benzene	--	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Benzonitrile	--	--	--	--	--	--	--	--	0.150
Chlorobenzene	--	--	0.011	0.011	0.011	0.011	0.011	0.011	0.011
Chloroethane	--	--	--	--	--	--	--	0.045	0.045
Cyclohexane	--	--	--	--	--	--	--	0.02	0.020
Dibromomethane	--	--	0.03	0.03	0.03	0.03	0.03	--	--
Dichloromethane (Methylene chloride)	--	--	0.07	0.25	0.25	0.25	0.25	0.25	0.250
Diethyl ether	--	--	--	--	--	--	--	0.04	0.040
Ethyl acetate	--	--	--	--	--	--	--	0.158	0.158

Chemical, in whole blood, ng/mL except as noted	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Ethylbenzene	--	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
Furan	--	--	--	--	0.025	0.025	0.025	0.025	0.025
Heptane	--	--	--	--	--	--	--	0.1	0.100
Hexane	--	--	--	--	--	--	--	0.122	0.122
Hexachloroethane	--	--	0.011	0.011	0.011	0.011	0.011	--	--
Isobutyronitrile	--	--	--	--	--	--	--	--	0.040
Isopropylbenzene (Cumene)	--	--	--	--	0.04	0.04	0.04	0.04	0.040
Methylcyclopentane	--	--	--	--	--	--	--	0.02	0.020
Methyl- <i>tert</i> -butyl ether (MTBE), pg/mL	--	0.232	2.0	1.4	1.4	1.40	1.40	10.0	10.0
Nitrobenzene	--	--	0.3	0.3	0.32	0.32	0.32	0.32	0.320
Nitromethane, pg/mL	--	--	--	--	0.32	65.0	65.0	--	--
Octane	--	--	--	--	--	--	--	0.1	0.100
Styrene	--	0.03	0.03	0.03	0.03	0.03	--	--	--
Tetrachloroethene (Perchloroethylene)	--	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048
Tetrachloromethane (Carbon tetrachloride)	--	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Tetrahydrofuran	--	--	--	--	--	--	--	0.125	0.125
Toluene	--	0.025	0.025	0.025	0.025	0.025	--	0.025	0.025
Trichloroethene (Trichloroethylene)	--	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
ααα-Trifluorotoluene	--	--	--	--	--	--	--	0.04	0.040
Vinyl bromide	--	--	--	--	--	--	--	0.045	0.045
<i>m</i> -/ <i>p</i> -Xylene	--	0.34	0.034	0.034	0.034	0.034	0.034	0.034	0.034
<i>o</i> -Xylene	--	0.049	0.049	0.024	0.024	0.024	0.024	0.024	0.024

Volatile Organic Compound (VOC) Metabolites

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
N-Acetyl-S-(2-carboxyethyl)-L-cysteine	--	--	--	6.96	--	--	6.96	6.96	--
N-Acetyl-S-(3-hydroxypropyl)-L-cysteine	--	--	--	13.0	--	--	13.0	13.0	--
N-Acetyl-S-(2-carbamoyl-ethyl)-L-cysteine	--	--	--	2.20	--	--	2.20	2.20	--
N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine	--	--	--	9.40	--	--	9.40	9.40	--

Chemical, in urine, µg/L	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
N-Acetyl-S-(2-cyanoethyl)-L-cysteine	--	--	--	0.500	--	--	0.500	0.500	--
N-Acetyl-S-(2-hydroxyethyl)-L-cysteine	--	--	--	0.791	--	--	0.791	0.791	--
N-Acetyl-S-(phenyl)-L-cysteine	--	--	--	0.600	--	--	0.600	0.600	--
N-Acetyl-S-(n-propyl)-L-cysteine	--	--	--	1.20	--	--	1.20	1.20	--
N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine	--	--	--	5.25	--	--	5.25	5.25	--
N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine	--	--	--	0.700	--	--	0.700	0.700	--
N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine	--	--	--	0.700	--	--	0.700	0.700	--
N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine	--	--	--	0.600	--	--	0.600	0.600	--
2-Thioxothiazolidine-4 carboxylic acid	--	--	--	11.2	--	--	11.2	11.2	--
N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine	--	--	--	2.0	--	--	2.0	3.00	--
2-Aminothiazoline-4-carboxylic acid	--	--	--	15.0	--	--	15.0	15.0	--
N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine	--	--	--	6.26	--	--	6.26	6.26	--
Phenylglyoxylic acid	--	--	--	12.0	--	--	12.0	12.0-	--
N-Acetyl-S-(2-hydroxypropyl)-L-cysteine	--	--	--	5.30	--	--	5.30	5.30	--
N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine	--	--	--	0.700	--	--	0.700	0.700	--
Mandelic acid	--	--	--	12.0	--	--	12.0	12.0	--
N-Acetyl-S-(trichlorovinyl)-L-cysteine	--	--	--	3.00	--	--	3.00	3.00	--
N-Acetyl-S-(benzyl)-L-cysteine	--	--	--	0.500	--	--	0.500	0.500	--
N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine	--	--	--	12.6	--	--	12.6	12.6	--
N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine	--	--	--	4.70	--	--	4.70	4.70	--
N-Acetyl-S-(dimethylphenyl)-L-cysteine	--	--	--	0.500	--	--	0.500	0.500	--
2-Methylhippuric acid	--	--	--	5.00	--	--	5.00	5.00	--
3- & 4-Methylhippuric acid	--	--	--	8.00	--	--	8.00	8.00	--

Organochlorine Pesticides and Metabolites (Pooled Samples after 2004)

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Aldrin	--	5.94	7.8	--	--	--	--	--	--
Dieldrin	--	10.5	7.8	--	--	--	--	--	--
Endrin	--	5.09	7.8	--	--	--	--	--	--

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
Heptachlor epoxide	--	10.5	7.8	--	--	--	--	--	--
Oxychlorane	14.5	10.5	7.8	1.46	1.4	14.14	0.92	1.3	--
trans-Nonachlor	14.5	10.5	7.8	0.77	1.4	2.19	0.92	1.3	--
p,p'-DDT	20.7	17.4	7.8	1.46	1.4	2.19	0.92	1.3	--
p,p'-DDE	18.6	8.3	7.8	4.02	1.4	3.68	3.1	1.8	--
o,p'-DDT	--	17.4	7.8	--	--	--	--	--	--
Hexachlorobenzene	118	31.4	7.8	4.17	1.4	3.11	1.7	1.3	--
beta-Hexachlorocyclohexane	9.36	6.76	7.8	1.46	1.4	2.19	0.92	1.3	--
gamma-Hexachlorocyclohexane	14.5	10.5	7.8	1.46	1.4	2.19	0.92	--	--
Mirex	14.6	10.5	7.8	1.46	1.4	2.19	0.92	1.3	--

Polybrominated Diphenyl Ethers and PBB 153 (Pooled Samples after 2004)

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,2',4'-Tribromodiphenyl ether (BDE 17)	--	--	1.0	0.6	0.6	0.59	0.33	0.26	--
2,4,4'-Tribromodiphenyl ether (BDE 28)	--	--	0.8	0.6	0.6	0.66	0.48	0.26	--
2,2',4,4'-Tetrabromodiphenyl ether (BDE 47)	--	--	4.2	1.6	0.6	0.64	0.70	1.0	--
2,3',4,4'-Tetrabromodiphenyl ether (BDE 66)	--	--	1.0	0.6	0.6	0.44	0.41	0.73	--
2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85)	--	--	2.4	0.6	0.6	0.44	0.19	0.26	--
2,2',4,4',5-Pentabromodiphenyl ether (BDE 99)	--	--	5.0	1.2	0.6	0.56	0.37	0.44	--
2,2',4,4',6-Pentabromodiphenyl ether (BDE 100)	--	--	1.4	0.6	0.6	0.44	0.71	0.26	--
2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153)	--	--	2.2	0.6	0.6	0.6	0.18	0.26	--
2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154)	--	--	0.8	0.6	0.6	0.58	0.18	0.26	--
2,2',3,4,4',5',6-Heptabromodiphenyl ether (BDE 183)	--	--	1.7	0.6	0.6	0.49	0.21	0.26	--
2,2',3,3',4',4',5,5',6,6'-Decabromodiphenyl ether (BDE 209)	--	--	--	6	5.8	2.19	1.13	1.3	--
2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153)	--	--	0.8	0.6	0.6	0.92	0.18	0.18	--

Polychlorinated Dibenzo-p-dioxins (Pooled Samples)

Chemical, in serum, pg/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	55.9	10.3	13.0	2.4	4.22	4.5	--	--	--

Chemical, in serum, pg/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	9.0	11.9	0.2	0.26	0.28	--	--	--
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	20.1	9.1	12.3	0.1	0.2	0.22	--	--	--
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	20.3	9.3	12.3	0.1	0.13	0.14	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	329.0	319.0	218.0	13.0	22.6	24	--	--	--
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	14.2	6.0	4.5	0.6	1.08	1.1	--	--	--
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	12.1	5.8	3.8	0.4	0.74	0.78	--	--	--

Polychlorinated Dibenzofurans (Pooled Samples after 2004)

Chemical, in serum, pg/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	13.5	7.0	8.6	1.03	1.78	1.9	--	--	--
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	7.0	8.6	0.19	0.33	0.35	--	--	--
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	12.7	6.5	7.4	0.3	0.51	0.55	--	--	--
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	12.6	6.1	7.9	0.1	0.18	0.19	--	--	--
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	12.7	6.0	8.3	0.2	0.35	0.37	--	--	--
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	12.9	5.8	8.2	0.11	0.2	0.21	--	--	--
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	35.6	21.0	12.0	1.37	2.37	2.6	--	--	--
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	13.2	5.8	7.1	0.47	0.81	0.85	--	--	--
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	12.7	5.5	6.8	0.51	0.88	0.92	--	--	--
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	11.9	5.2	6.0	0.26	0.45	0.48	--	--	--

Dioxin-like Polychlorinated Biphenyls: Coplanar PCBs (Pooled Samples after 2004)

Chemical, in serum, pg/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	68.4	26.8	13.1	1.86	3.23	3.5	--	--	--
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	23.2	10.8	13.9	1.32	2.29	2.5	--	--	--
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	27.0	11.0	15.9	1.33	2.31	2.5	--	--	--

Dioxin-like Polychlorinated Biphenyls: mono-ortho-substituted PCBs (Pooled Samples after 2004)

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	12.4	10.5	0.4	0.31	0.3	0.37	0.19	0.26	--

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,3,3',4,4'-Pentachlorobiphenyl (PCB 114)	--	--	--	0.31	0.3	0.44	0.18	0.26	--
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	12.5	10.5	0.6	0.72	0.3	0.44	0.19	0.26	--
2',3,4,4',5-Pentachlorobiphenyl (PCB 123)	--	--	--	0.31	0.3	--	--	--	--
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	12.5	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	12.5	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	12.4	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	--	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--

Polychlorinated Biphenyls: Non-Dioxin-Like (Pooled Samples after 2004)

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,4,4'-Trichlorobiphenyl (PCB 28)	32.4	--	1.7	2.54	0.7	0.92	0.50	0.27	--
2,2',3,5'-Tetrachloro biphenyl (PCB 44)	--	--	0.4	0.36	0.3	--	--	--	--
2,2',4,5'-Tetrachloro biphenyl (PCB 49)	--	--	0.4	0.31	0.3	--	--	--	--
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	12.5	12.4	0.8	0.33	0.3	--	--	--	--
2,3',4,4'-Tetrachlorobiphenyl (PCB 66)	12.4	12.4	0.8	0.4	0.3	0.69	0.26	0.26	--
2,4,4',5-Tetrachlorobiphenyl (PCB 74)	12.4	10.5	0.8	0.31	0.8	0.78	0.26	0.27	--
2,2',3,4,5'-Pentachlorobiphenyl (PCB 87)	--	10.5	0.4	0.31	0.3	--	--	--	--
2,2',4,4',5-Pentachlorobiphenyl (PCB 99)	12.5	10.5	0.6	0.31	0.3	0.44	0.18	0.26	--
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	25.7	10.5	0.6	0.59	0.3	--	--	--	--
2,3,3',4',6-Pentachlorobiphenyl (PCB 110)	--	10.5	0.8	0.31	0.3	--	--	--	--
2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128)	12.4	10.5	0.4	0.31	0.3	--	--	--	--
2,2',3,4,4',5' & 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158)	41.1	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146)	12.4	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,2',3,4',5,6-Hexachlorobiphenyl (PCB 149)	10.5	--	0.4	0.31	0.3	--	--	--	--
2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151)	--	10.5	0.4	0.31	0.3	--	--	--	--
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	55.6	10.5	1.1	0.31	0.3	0.59	0.21	0.26	--
2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170)	17.2	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,2',3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 172)	12.5	10.5	0.4	0.31	0.3	--	--	--	--
2,2',3,3',4,4',5,6'-Heptachlorobiphenyl (PCB 177)	12.5	10.5	0.4	0.31	0.3	--	--	--	--

Chemical, in serum, ng/g lipid	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014	2015-2016
2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178)	12.4	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	28.2	10.5	0.4	0.31	0.3	0.44	0.21	0.26	--
2,2',3,4,4',5,6-Heptachlorobiphenyl (PCB 183)	12.4	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187)	12.4	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194)	--	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195)	--	28.1	0.7	0.31	0.3	--	--	--	--
2,2',3,3',4,4',5,6' & 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203)	--	10.5	0.4	0.31	0.3	0.44	0.18	0.26	--
2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199)	--	10.5	0.4	0.31	0.3	0.44	0.7	0.26	--
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206)	--	28.1	0.7	0.31	0.3	0.44	1.1	0.26	--
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB 209)	--	--	0.7	0.31	0.3	0.44	0.18	0.26	--

Appendix D. References for Biomonitoring Analytical Methods

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