Term
Acceptable Daily Intake Definition: The amount of a chemical a person can be exposed to on a daily basis over an extended period of time (usually a lifetime) without suffering deleterious effects. Acronym: ADI
Acute Exposure Definition: Exposure by the oral, dermal, or inhalation route for 24 hours or less.
Acute Reference Concentration Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure for an acute duration (24 hours or less) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark concentration, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments. Acronym: Acute RfC
Acute Reference Dose Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure for an acute duration (24 hours or less) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark dose, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments. Acronym: Acute RfD

Term
Acute Toxicity Definition: Any poisonous effect produced within a short period of time following an exposure, usually 24 to 96 hours.
Added Risk Definition: See Additional Risk.
Additional Risk Definition: The calculated difference in risk of a particular condition between those who are exposed and those who are not. This measure is derived by subtracting the rate (usually incidence or mortality) of the disease among the unexposed persons (Pu) from the corresponding rate among the exposed (Pe), i.e., AR= Pe-Pu. The AR is an absolute measure of the excess risk attributed to exposure. Acronym: AR
Adverse Effect Definition: A biochemical change, functional impairment, or pathologic lesion that affects the performance of the whole organism, or reduces an organism's ability to respond to an additional environmental challenge.
Aerodynamic Diameter Definition: The diameter of a sphere with unit density that has aerodynamic behavior identical to that of the particle in question; an expression of aerodynamic behavior of an irregularly shaped particle in terms of the diameter of an idealized particle. Particles having the same aerodynamic diameter may have different dimensions and shapes.

Term
Aerosol Definition: A suspension of liquid or solid particles in air.
Anecdotal Data Definition: Data based on the description of individual cases rather than controlled studies.
Attributable Risk Definition: See Additional Risk.
Average Daily Dose Definition: Dose rate averaged over a pathway-specific period of exposure expressed as a daily dose on a per-unit-body-weight basis. The ADD is usually expressed in terms of mg/kg-day or other mass-time units. Acronym: ADD
Background Levels Definition: Two types of background levels may exist for chemical substances: (a) Naturally occurring levels: Ambient concentrations of substances present in the environment, without human influence; (b) Anthropogenic levels: Concentrations of substances present in the environment due to human-made, non-site sources (e.g., automobiles, industries).
Benchmark Concentration

Term
Definition: A dose or concentration that produces a predetermined change in response rate of an adverse effect (called the benchmark response or BMR) compared to background. Acronym: BMC
Benchmark Dose Definition: A dose or concentration that produces a predetermined change in response rate of an adverse effect (called the benchmark response or BMR) compared to background. Acronym: BMD
Benchmark Response Definition: An adverse effect, used to define a benchmark dose from which an RfD (or RfC) can be developed. The change in response rate over background of the BMR is usually in the range of 5-10%, which is the limit of responses typically observed in well-conducted animal experiments. Acronym: BMR
Benign Tumor Definition: A tumor that does not spread to a secondary localization, but may impair normal biological function through obstruction or may progress to malignancy later.
Bioassay Definition: An assay for determining the potency (or concentration) of a substance that causes a biological change in experimental animals.

Term
Bioavailability Definition: The degree to which a substance becomes available to the target tissue after administration or exposure.
Biologically Based Dose Response Model Definition: A predictive model that describes biological processes at the cellular and molecular level linking the target organ dose to the adverse effect. Acronym: BBDR Model
Blood to Air Partition Coefficient Definition: A ratio of a chemical's concentration between blood and air when at equilibrium.
BMCL Definition: A statistical lower confidence limit on the dose or concentration at the BMD or BMC, respectively.
BMDL Definition: A statistical lower confidence limit on the dose or concentration at the BMD or BMC, respectively.
Cancer Definition: A disease of heritable, somatic mutations affecting cell growth and differentiation, characterized by an abnormal, uncontrolled growth of cells.

Term
Carcinogen Definition: An agent capable of inducing cancer.
Carcinogenesis Definition: The origin or production of a benign or malignant tumor. The carcinogenic event modifies the genome and/or other molecular control mechanisms of the target cells, giving rise to a population of altered cells.
CAS Registry Number Definition: The Chemical Abstract Service Registry Number (CASRN) is an unique numeric identifier, designed to designate only one substance so it can be referenced by many Government Agencies and/or internationally. Acronym: CASRN
Case-control Study Definition: An epidemiologic study contrasting those with the disease of interest (cases) to those without the disease (controls). The groups are then compared with respect to exposure history, to ascertain whether they differ in the proportion exposed to the chemical(s) under investigation.
Chronic Effect Definition: An effect that occurs as a result of repeated or long term (chronic) exposures.
Chronic Exposure

Term
Definition: Repeated exposure by the oral, dermal, or inhalation route for more than approximately 10% of the life span in humans (more than approximately 90 days to 2 years in typically used laboratory animal species).
Chronic Reference Concentration Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure for a chronic duration (up to a lifetime) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark concentration, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments. Acronym: Chronic RfC
Chronic Reference Dose Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure for a chronic duration (up to a lifetime) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark dose, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments. Acronym: Chronic RfD
Chronic Study Definition: A toxicity study designed to measure the (toxic) effects of chronic exposure to a chemical.
Chronic Toxicity Definition: The capacity of a substance to cause adverse human health effects as a result of chronic exposure.

Term
Co-carcinogen Definition: An agent that, when administered with a carcinogen, enhances the activity of the carcinogen.
Cohort Study Definition: An epidemiologic study comparing those with an exposure of interest to those without the exposure. These two cohorts are then followed over time to determine the differences in the rates of disease between the exposure subjects.
Confounder Definition: A condition or variable that is both a risk factor for disease and associated with an exposure of interest. This association between the exposure of interest and the confounder (a true risk factor for disease) may make it falsely appear that the exposure of interest is associated with disease.
Confounding Factor Definition: See Confounder.
Control Group Definition: A group used as the baseline for comparison in epidemiologic studies or laboratory studies. This group is selected because it either lacks the disease of interest (case-control group) or lacks the exposure of concern (cohort study).
Critical Concentration

Term
Definition: An ambient chemical concentration expressed in units of μg/m³ and used in the operational derivation of the inhalation RfC. This concentration will be the NOAEL Human Equivalent Concentration (HEC) adjusted from principal study data.
Critical Effect Definition: The first adverse effect, or its known precursor, that occurs to the most sensitive species as the dose rate of an agent increases.
Critical Study Definition: The study that contributes most significantly to the qualitative and quantitative assessment of risk. Also called Principal Study.
Developmental Toxicity Definition: Adverse effects on the developing organism that may result from exposure prior to conception (either parent), during prenatal development, or postnatally until the time of sexual maturation. The major manifestations of developmental toxicity include death of the developing organism, structural abnormality, altered growth, and functional deficiency.
Dose Definition: The amount of a substance available for interactions with metabolic processes or biologically significant receptors after crossing the outer boundary of an organism. The POTENTIAL DOSE is the amount ingested, inhaled, or applied to the skin. The APPLIED DOSE is the amount presented to an absorption barrier and available for absorption (although not necessarily having yet crossed the outer boundary of the organism). The ABSORBED DOSE is the amount crossing a specific absorption barrier (e.g. the exchange boundaries of the skin, lung, and digestive tract) through uptake processes. INTERNAL DOSE is a more general term

Term
denoting the amount absorbed without respect to specific absorption barriers or exchange boundaries. The amount of the chemical available for interaction by any particular organ or cell is termed the DELIVERED or BIOLOGICALLY EFFECTIVE DOSE for that organ or cell.
Dose-Response Assessment Definition: A determination of the relationship between the magnitude of an administered, applied, or internal dose and a specific biological response. Response can be expressed as measured or observed incidence or change in level of response, percent response in groups of subjects (or populations), or the probability of occurrence or change in level of response within a population.
Dose-Response Relationship Definition: The relationship between a quantified exposure (dose) and the proportion of subjects demonstrating specific biologically significant changes in incidence and/or in degree of change (response).
Effective Dose Definition: The dose corresponding to a 10% increase in an adverse effect, relative to the control response. Acronym: ED
Endpoint Definition: An observable or measurable biological event or chemical concentration (e.g., metabolite concentration in a target tissue) used as an index of an effect of a chemical exposure.
Epidemiology

Term
Definition: The study of the distribution and determinants of health-related states or events in specified populations.
Estimated Exposure Dose Definition: The measured or calculated dose to which humans are likely to be exposed considering all sources and routes of exposure. Acronym: EED
Excess Lifetime Risk Definition: The additional or extra risk of developing cancer due to exposure to a toxic substance incurred over the lifetime of an individual.
Exposure Definition: Contact made between a chemical, physical, or biological agent and the outer boundary of an organism. Exposure is quantified as the amount of an agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut).
Exposure Assessment Definition: An identification and evaluation of the human population exposed to a toxic agent, describing its composition and size, as well as the type, magnitude, frequency, route and duration of exposure.
Extra Risk Definition: A calculation of risk of adverse effects which adjusts for background incidence rates of the same effects, by estimating risk at dose d only among the fraction of the population not expected to respond to the secondary (background) causes: ER = [P(d)-

Term
P(0)/1-P(0)]. For example, if the background rate (P(0)) = 0.8 and the response rate at dose d, P(d) = .9, then ER = (0.9 - 0.8)/(1-0.8) = 0.1/0.2 = 0.5. That is, at dose d, an additional 10% of the population is expected to respond adversely. But since only 20% of the population was expected to be free of adverse effects without the exposure of interest, this 10% represents 50% of the population that would otherwise have been unharmed by this exposure. Acronym: ER
Extrapolation, low dose Definition: An estimate of the response at a point below the range of the experimental data, generally through the use of a mathematical model.
Forced Expiratory Volume Definition: The volume of air that can be forcibly exhaled during the first second of expiration following a maximal inspiration. Acronym: FEV
Forced Vital Capacity Definition: The maximal volume of air that can be exhaled as forcibly and rapidly as possible after a maximal inspiration. Acronym: FVC
Frank Effect Level Definition: A level of exposure or dose that produces irreversible, adverse effects at a statistically or biologically significant increase in frequency or severity between those exposed and those not exposed. Acronym: FEL

Term
Functional Residual Capacity Definition: The lung volume at the end of tidal expiration (TLC - IC). Acronym: FRC
Gamma (Multi-Hit) Model Definition: A generalization of the one-hit model (see definition) for low-dose extrapolation.
Guidelines (human health risk assessment) Definition: Official, peer-reviewed documentation stating current U.S. EPA methodology in assessing risk of harm from environmental pollutants to populations. Examples: Guidelines for Carcinogenic Risk Assessment: U.S. EPA guidelines intended to guide Agency evaluation of suspect carcinogens. 66 FR 17765-17817, April 7, 2005; Guidelines for Exposure Assessment: U.S. EPA guidelines intended to guide Agency analysis of potential exposure to chemical substances. 51 FR 22888-22938, May 29,1992; Guidelines for Developmental Toxicity Risk Assessment: U.S. EPA guidelines intended to guide Agency analysis of developmental toxicity data. 51 FR 34028-34040, October 1996; Guidelines for Mutagenicity Risk Assessment: U. S. EPA guidelines intended to guide Agency analysis of mutagenicity data. 51 FR 34006-34016, September, 1986.
Hazard Definition: A potential source of harm.
Hazard Assessment Definition: The process of determining whether exposure to an agent can cause an increase in the incidence of a particular adverse

Term
health effect (e.g., cancer, birth defect) and whether the adverse health effect is likely to occur in humans.
Hazard Characterization Definition: A description of the potential adverse health effects attributable to a specific environmental agent, the mechanisms by which agents exert their toxic effects, and the associated dose, route, duration, and timing of exposure.
Human Equivalent Concentration Definition: The human concentration (for inhalation exposure) or dose (for other routes of exposure) of an agent that is believed to induce the same magnitude of toxic effect as the experimental animal species concentration or dose. This adjustment may incorporate toxicokinetic information on the particular agent, if available, or use a default procedure, such as assuming that daily oral doses experienced for a lifetime are proportional to body weight raised to the 0.75 power. Acronym: HEC
Human Equivalent Dose Definition: The human concentration (for inhalation exposure) or dose (for other routes of exposure) of an agent that is believed to induce the same magnitude of toxic effect as the experimental animal species concentration or dose. This adjustment may incorporate toxicokinetic information on the particular agent, if available, or use a default procedure, such as assuming that daily oral doses experienced for a lifetime are proportional to body weight raised to the 0.75 power. Acronym: HED
Incidence Definition: The number of new cases of a disease that develop within a specified population over a specified period of time.

Term
Incidence Rate Definition: The ratio of new cases within a population to the total population at risk given a specified period of time.
Individual Risk Definition: The probability that an individual will experience an adverse effect.
Inhalation Unit Risk Definition: The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 μg/m³ in air. The interpretation of inhalation unit risk would be as follows: if unit risk = 2 × 10 per μg/m³, 2 excess cancer cases (upper bound estimate) are expected to develop per 1,000,000 people if exposed daily for a lifetime to 1 μg of the chemical per m³ of air.
Initiation Definition: The first stage of carcinogenesis.
Interspecies Dose Conversion Definition: The process of extrapolating from animal doses to human equivalent doses.
Latency Period Definition: The time between first exposure to an agent and manifestation or detection of a health effect of interest.

Term
Limited Evidence Definition: A term used in evaluating study data for the classification of a carcinogen by the 1986 U.S. EPA guidelines for carcinogen risk assessment. This classification indicates that a causal interpretation is credible but that alternative explanations such as chance, bias, and confounding variables could not be completely excluded.
Linear Dose Response Definition: A pattern of frequency or severity of biological response that varies directly with the amount of dose of an agent.
Linearized Multistage Procedure Definition: A modification of the multistage model, used for estimating carcinogenic risk, that incorporates a linear upper bound on extra risk for exposures below the experimental range.
Logistic Model Definition: A dose-response model used for low-dose extrapolation.
Longer-Term Exposure Definition: Repeated exposure by the oral, dermal, or inhalation route for more than 30 days, up to approximately 10% of the life span in humans (more than 30 days up to approximately 90 days in typically used laboratory animal species).
Lower Limit on Effective Dose

Term
Definition: The 95% lower confidence limit of the dose of a chemical needed to produce an adverse effect in 10 percent of those exposed to the chemical, relative to control. Acronym: LED
Lowest-Observed-Adverse-Effect Level Definition: The lowest exposure level at which there are biologically significant increases in frequency or severity of adverse effects between the exposed population and its appropriate control group. Acronym: LOAEL
Lowest-Observed-Effect Level Definition: In a study, the lowest dose or exposure level at which a statistically or biologically significant effect is observed in the exposed population compared with an appropriate unexposed control group. Acronym: LEL, LOEL
Malignant Tumor Definition: An abnormal growth of tissue which can invade adjacent or distant tissues.
Margin of Exposure Definition: The LED or other point of departure divided by the actual or projected environmental exposure of interest. Acronym: MOE
Mass Median Aerodynamic Diameter

Term
Definition: Median of the distribution of airborne particle mass with respect to the aerodynamic diameter. MMADs are usually accompanied by the geometric standard deviation (g or sigma g) which characterizes the variability of the particle size distribution. Acronym: MMAD
Maximum Likelihood Estimate Definition: Statistical method for estimating a population parameter most likely to have produced the sample observations. Acronym: MLE
Maximum Likelihood Method Definition: Statistical method for estimating a population parameter most likely to have produced the sample observations. Acronym: ML Method
Metastasis Definition: The dissemination or secondary growth of a malignant tumor at a site distant from the primary tumor.
Model Definition: A mathematical function with parameters that can be adjusted so the function closely describes a set of empirical data. A mechanistic model usually reflects observed or hypothesized biological or physical mechanisms, and has model parameters with real world interpretation. In contrast, statistical or empirical models selected for particular numerical properties are fitted to data; model parameters may or may not have real world interpretation. When data quality is otherwise equivalent, extrapolation from mechanistic models (e.g., biologically based dose-response models) often carries higher confidence than extrapolation using empirical models (e.g., logistic model).

Term
Modifying Factor Definition: A factor used in the derivation of a reference dose or reference concentration. The magnitude of the MF reflects the scientific uncertainties of the study and database not explicitly treated with standard uncertainty factors (e.g., the completeness of the overall database). A MF is greater than zero and less than or equal to 10, and the default value for the MF is 1. [Use of a modifying factor was discontinued in 2004.] Acronym: MF
Monte Carlo Technique Definition: A repeated random sampling from the distribution of values for each of the parameters in a calculation (e.g., lifetime average daily exposure), to derive a distribution of estimates (of exposures) in the population.
Multistage Model Definition: A mathematical function used to extrapolate the probability of cancer from animal bioassay data.
Multistage Weibull Model Definition: A dose-response model for low-dose extrapolation that includes a term for decreased survival time associated with tumor incidence.
Mutagen Definition: A substance that can induce an alteration in the structure of DNA.
Neoplasm

Term
Definition: An abnormal growth of tissue that may be benign or malignant.
No-Observed-Adverse-Effect Level Definition: The highest exposure level at which there are no biologically significant increases in the frequency or severity of adverse effect between the exposed population and its appropriate control; some effects may be produced at this level, but they are not considered adverse or precursors of adverse effects. Acronym: NOAEL
No-Observed-Effect Level Definition: An exposure level at which there are no statistically or biologically significant increases in the frequency or severity of any effect between the exposed population and its appropriate control. Acronym: NOEL
Non-Linear Dose Response Definition: A pattern of frequency or severity of biological response that does not vary directly with the amount of dose of an agent.
Odds Ratio Definition: A relative measure of the difference in exposure between the diseased (cases) and not diseased (controls) individuals in a case-control study. The OR is interpreted similarly to the relative risk. Acronym: OR
Oncogenic

Term
Definition: Resulting from a gene that can induce neoplastic transformations in the cell in which it occurs or into which it is introduced.
One Hit Model Definition: A dose-response model based on a mechanistic argument that there is a response after a target site has been hit by a single biologically effective unit of dose within a given time period.
Oral Slope Factor Definition: An upper bound, approximating a 95% confidence limit, on the increased cancer risk from a lifetime oral exposure to an agent. This estimate, usually expressed in units of proportion (of a population) affected per mg/kg-day, is generally reserved for use in the low-dose region of the dose-response relationship, that is, for exposures corresponding to risks less than 1 in 100.
Organoleptic Definition: Affecting or involving a sense organ such as that of taste, smell, or sight.
Pharmacodynamics Definition: See Toxicodynamics.
Pharmacokinetics Definition: See Toxicokinetics.
Physiologically Based Pharmacokinetic Model

Term
Definition: A model that estimates the dose to a target tissue or organ by taking into account the rate of absorption into the body, distribution among target organs and tissues, metabolism, and excretion. Acronym: PBPK Model
Point of Departure Definition: The dose-response point that marks the beginning of a low-dose extrapolation. This point can be the lower bound on dose for an estimated incidence or a change in response level from a dose-response model (BMD), or a NOAEL or LOAEL for an observed incidence, or change in level of response.
ppb Definition: A unit of measure expressed as parts per billion. Equivalent to 1 x 10.
ppm Definition: A unit of measure expressed as parts per million. Equivalent to 1 x 10.
Prevalence Definition: The proportion of disease cases that exist within a population at a specific point in time, relative to the number of individuals within that population at the same point in time.
Principal Study

Term
Definition: See Critical Study.
Probit Model Definition: A dose-response model.
Promoter Definition: An agent that is not carcinogenic itself, but when administered after an initiator of carcinogenesis, stimulates the clonal expansion of the initiated cell to produce a neoplasm.
Proportionate Mortality Ratio Definition: The proportion of deaths due to the disease of interest in the exposed population divided by the proportion of deaths due to the disease of interest in the unexposed or reference population. It is frequently converted to a percent by multiplying the ratio by 100. Acronym: PMR
Prospective Study Definition: See Cohort Study.
Reference Concentration Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark concentration, with uncertainty factors generally applied to reflect limitations of the

Term
data used. Generally used in EPA's noncancer health assessments. [Durations include acute, short-term, subchronic, and chronic and are defined individually in this glossary]. Acronym: RfC
Reference Dose Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark dose, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments. [Durations include acute, short-term, subchronic, and chronic and are defined individually in this glossary]. Acronym: RfD
Reference Group Definition: See Control Group.
Reference Value Definition: An estimate of an exposure for a given duration to the human population (including susceptible subgroups) that is likely to be without an appreciable risk of adverse health effects over a lifetime. It is derived from a BMDL, a NOAEL, a LOAEL, or another suitable point of departure, with uncertainty/variability factors applied to reflect limitations of the data used. [Durations include acute, short-term, subchronic, and chronic and are defined individually in this glossary.] [Reference value is a term proposed in the report, "A Review of the Reference Dose and Reference Concentration Processes" (EPA, 2002), and is a generic term not specific to a given route of exposure. EPA develops numerical toxicity values for the RfD and RfC only; no numerical toxicity values are developed for the RfV.]

Term
the RfV.] Acronym: RfV
Regional Deposited Dose Definition: The deposited dose of particles calculated for a respiratory tract region of interest (r) as related to an observed toxicity. For respiratory effects of particles, the deposited dose is adjusted for ventilatory volumes and the surface area of the respiratory region effected (mg/min-sq. cm). For extra respiratory effects of particles, the deposited dose in the total respiratory system is adjusted for ventilatory volumes and body weight (mg/min-kg). Acronym: RDD
Regional Deposited Dose Ratio Definition: The ratio of the regional deposited dose calculated for a given exposure in the animal species of interest to the regional deposited dose of the same exposure in a human. This ratio is used to adjust the exposure effect level for interspecies dosimetric differences to derive a human equivalent concentration for particles. Acronym: RDDR
Regional Gas Dose Definition: The gas dose calculated for the region of interest as related to the observed effect for respiratory effects. The deposited dose is adjusted for ventilatory volumes and the surface area of the respiratory region effected (mg/min-sq.cm).
Regional Gas Dose Ratio Definition: The ratio of the regional gas dose calculated for a given exposure in the animal species of interest to the regional gas dose

Term
of the same exposure in humans. This ratio is used to adjust the exposure effect level for interspecies dosimetric differences to derive a human equivalent concentration for gases with respiratory effects. Acronym: RGDR
Relative Risk Definition: The relative measure of the difference in risk between the exposed and unexposed populations in a cohort study. The relative risk is defined as the rate of disease among the exposed divided by the rate of the disease among the unexposed. A relative risk of 2 means that the exposed group has twice the disease risk as the unexposed group. Acronym: RR
Reserve Volume Definition: The volume of air remaining in the lungs after a maximal expiration.
Residual Volume Definition: The lung volume after maximal expiration (TLC - VC). Acronym: RV
Risk Assessment (human health) Definition: The evaluation of scientific information on the hazardous properties of environmental agents (hazard characterization), the dose-response relationship (dose-response assessment), and the extent of human exposure to those agents (exposure assessment). The product of the risk assessment is a statement regarding the probability that populations or individuals so exposed will be harmed and to what degree (risk characterization).

Term
Risk Characterization Definition: The integration of information on hazard, exposure, and dose-response to provide an estimate of the likelihood that any of the identified adverse effects will occur in exposed people.
Risk Difference Definition: See Additional Risk.
Risk (human health) Definition: The probability of adverse effects resulting from exposure to an environmental agent or mixture of agents.
Risk Management (human health) Definition: A decision making process that accounts for political, social, economic and engineering implications together with risk-related information in order to develop, analyze and compare management options and select the appropriate managerial response to a potential chronic health hazard.
Risk Ratio Definition: See Relative Risk. Acronym: RR
Short Term Exposure

Term
Definition: Repeated exposure by the oral, dermal, or inhalation route for more than 24 hours, up to 30 days.
Short Term Reference Concentration Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure for short-term duration (up to 30 days) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark concentration, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments. Acronym: Short Term RfC
Short Term Reference Dose Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure for a short-term duration (up to 30 days) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark dose, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments. Acronym: Short Term RfD
Sigma g Definition: Geometric standard deviation. (See Mass Median Aerodynamic Diameter.) Acronym: s g
Slope Factor Definition: An upper bound, approximating a 95% confidence limit, on the increased cancer risk from a lifetime exposure to an agent.

Term
This estimate, usually expressed in units of proportion (of a population) affected per mg/kg-day, is generally reserved for use in the low-dose region of the dose-response relationship, that is, for exposures corresponding to risks less than 1 in 100.
Standardized Mortality Ratio Definition: This is the relative measure of the difference in risk between the exposed and unexposed populations in a cohort study. The SMR is similar to the relative risk in both definition and interpretation. This measure is usually standardized to control for any differences in age, sex, and/or race between the exposed and reference populations. It is frequently converted to a percent by multiplying the ratio by 100. Acronym: SMR
Statistical Significance Definition: The probability that a result is not likely to be due to chance alone. By convention, a difference between two groups is usually considered statistically significant if chance could explain it only 5% of the time or less. Study design considerations may influence the a priori choice of a different level of statistical significance.
Subchronic Exposure Definition: Repeated exposure by the oral, dermal, or inhalation route for more than 30 days, up to approximately 10% of the life span in humans (more than 30 days up to approximately 90 days in typically used laboratory animal species). [See also longer-term exposure.]
Subchronic Reference Concentration Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure for a

Term
subchronic duration (up to 10% of average lifespan) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark concentration, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments. Acronym: Subchronic RfC
Subchronic Reference Dose Definition: An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure for a subchronic duration (up to 10% of average lifespan) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It can be derived from a NOAEL, LOAEL, or benchmark dose, with uncertainty factors generally applied to reflect limitations of the data used. Generally used in EPA's noncancer health assessments. Acronym: Subchronic RfD
Subchronic Study Definition: A toxicity study designed to measure effects from subchronic exposure to a chemical.
Sufficient Evidence Definition: A term used in evaluating study data for the classification of a carcinogen under the 1986 U.S. EPA guidelines for carcinogen risk assessment. This classification indicates that there is a causal relationship between the agent or agents and human cancer.
Superfund

Term
Definition: Federal authority, established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1980, to respond directly to releases or threatened releases of hazardous substances that may endanger health or welfare.
Supporting Studies Definition: Studies that contain information useful for providing insight and support for conclusions.
Susceptibility Definition: Increased likelihood of an adverse effect, often discussed in terms of relationship to a factor that can be used to describe a human subpopulation (e.g., life stage, demographic feature, or genetic characteristic).
Susceptible Subgroups Definition: May refer to life stages, for example, children or the elderly, or to other segments of the population, for example, asthmatics or the immune-compromised, but are likely to be somewhat chemical-specific and may not be consistently defined in all cases.
Systemic Effects Definition: Toxic effects as a result of absorption and distribution of a toxicant to a site distant from its entry point.
Systemic Toxicity Definition: Toxic effects as a result of absorption and distribution of a toxicant to a site distant from its entry point.

Term
Target Organ Definition: The biological organ(s) most adversely affected by exposure to a chemical, physical, or biological agent.
Teratogenic Definition: Structural developmental defects due to exposure to a chemical agent during formation of individual organs.
Threshold Definition: The dose or exposure below which no deleterious effect is expected to occur.
Threshold Limit Value Definition: Recommended guidelines for occupational exposure to airborne contaminants published by the American Conference of Governmental Industrial Hygienists (ACGIH). TLVs represent the average concentration in mg/m³ for an 8-hour workday and a 40-hour work week to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. Acronym: TLV
Tidal Volume Definition: The volume of air inhaled/exhaled during normal breathing. Acronym: VT
Total Lung Volume

Term
Definition: The lung volume at maximal inspiration. Acronym: TLV
Toxic Substance Definition: A chemical, physical, or biological agent that may cause an adverse effect or effects to biological systems.
Toxicity Definition: Deleterious or adverse biological effects elicited by a chemical, physical, or biological agent.
Toxicodynamics Definition: The determination and quantification of the sequence of events at the cellular and molecular levels leading to a toxic response to an environmental agent (sometimes referred to as pharmacodynamics).
Toxicokinetics Definition: The determination and quantification of the time course of absorption, distribution, biotransformation, and excretion of chemicals (sometimes referred to as pharmacokinetics).
Toxicology Definition: The study of harmful interactions between chemical, physical, or biological agents and biological systems.
Tumor

Term
Definition: An abnormal, uncontrolled growth of cells. Synonym: neoplasm
Tumor Progression Definition: Under the Armitage-Doll multistage theory of cancer development, the transition of a cell line between the stages which lead to cancer.
Uncertainty Definition: Uncertainty occurs because of a lack of knowledge. It is not the same as variability. For example, a risk assessor may be very certain that different people drink different amounts of water but may be uncertain about how much variability there is in water intakes within the population. Uncertainty can often be reduced by collecting more and better data, whereas variability is an inherent property of the population being evaluated. Variability can be better characterized with more data but it cannot be reduced or eliminated. Efforts to clearly distinguish between variability and uncertainty are important for both risk assessment and risk characterization.
Uncertainty Factor Definition: One of several, generally 10-fold, default factors used in operationally deriving the RfD and RfC from experimental data. The factors are intended to account for (1) variation in susceptibility among the members of the human population (i.e., inter-individual or intraspecies variability); (2) uncertainty in extrapolating animal data to humans (i.e., interspecies uncertainty); (3) uncertainty in extrapolating from data obtained in a study with less-than-lifetime exposure (i.e., extrapolating from subchronic to chronic exposure); (4) uncertainty in extrapolating from a LOAEL rather than from a NOAEL; and (5) uncertainty associated with extrapolation when the database is incomplete. Acronym: UF

Term
Unit Risk Definition: The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 µg/L in water, or 1 µg/m³ in air. The interpretation of unit risk would be as follows: if unit risk = 2 × 10 per µg/L, 2 excess cancer cases (upper bound estimate) are expected to develop per 1,000,000 people if exposed daily for a lifetime to 1 µg of the chemical per liter of drinking water.
Upper Bound Definition: A plausible upper limit to the true value of a quantity. This is usually not a true statistical confidence limit.
Variability Definition: Variability refers to true heterogeneity or diversity. For example, among a population that drinks water from the same source and with the same contaminant concentration, the risks from consuming the water may vary. This may be due to differences in exposure (i.e., different people drinking different amounts of water and having different body weights, different exposure frequencies, and different exposure durations) as well as differences in response (e.g., genetic differences in resistance to a chemical dose). Those inherent differences are referred to as variability. Differences among individuals in a population are referred to as inter-individual variability, differences for one individual over time is referred to as intra-individual variability.
Variability Factor Definition: One of several, generally 10-fold, default factors used in operationally deriving the RfD and RfC from experimental data. The factors are intended to account for (1) variation in susceptibility among the members of the human population (i.e., inter-individual or intraspecies variability); (2) uncertainty in extrapolating animal data to humans (i.e., interspecies uncertainty); (3)

Term
uncertainty in extrapolating from data obtained in a study with less-than-lifetime exposure (i.e., extrapolating from subchronic to chronic exposure); (4) uncertainty in extrapolating from a LOAEL rather than from a NOAEL; and (5) uncertainty associated with extrapolation when the database is incomplete.
Vital Capacity Definition: The maximum volume that can be exhaled in a single breath (TLC-RC). Acronym: VC
Weibull Model Definition: A dose-response model.
Weight-of-Evidence for Carcinogenicity Definition: A system used by the U.S. EPA for characterizing the extent to which the available data support the hypothesis that an agent causes cancer in humans. Under EPA's 1986 risk assessment guidelines, the WOE was described by categories "A through E", Group A for known human carcinogens through Group E for agents with evidence of noncarcinogenicity. The approach outlined in EPA's guidelines for carcinogen risk assessment (2005) considers all scientific information in determining whether and under what conditions an agent may cause cancer in humans, and provides a narrative approach to characterize carcinogenicity rather than categories. Five standard weight-of-evidence descriptors are used as part of the narrative. Acronym: WOE for Carcinogenicity