

18. Lifetime

18.1 Introduction

The length of an individual's life is an important factor to consider when evaluating cancer risk because the dose estimate is averaged over an individual's lifetime. Because the averaging time is found in the denominator of the dose equation, a shorter lifetime would result in a higher potential risk estimate, and conversely, a longer life expectancy would produce a lower potential risk estimate. Chapter 18 of the *Exposure Factors Handbook* provides information and recommendations for life expectancy. These data are highlighted here.

18.2 Recommended Exposure Factors

The life expectancy values presented in Table 18-1 are based on data from Xu et al. (2010). These data are based on information compiled from death certificates. Using data for 2007, life expectancy for an average person in the United States is 78 years. If sex is a factor considered in the assessment, note that the average life expectancy value for females is higher than for males. It is recommended that the assessor use the appropriate value of 75 years for males or 80 years for females. If race is a consideration in assessing exposure for individuals, note that the life expectancy is longer for Whites than for Blacks. Therefore, assessors are encouraged to use values that most reflect the exposed population. Tables 18-4 and 18-5 in the *Exposure Factors Handbook* provide life expectancy data for Whites and Blacks separately.

The recommended value of 78 for the total population is different than the 70 years commonly assumed for the general population in U.S. EPA risk assessments. The Integrated Risk Information System (IRIS) does not use a 70-year lifetime assumption in the derivation of RfCs and RfDs, cancer slope factors, or unit risks. Therefore, using a value different than 70 years will not result in an inconsistency with the toxicity data. Overall confidence in the life expectancy recommendations is high.



Table 18-1. Recommended Values for Expectation of Life at Birth: 2005

| Population | Life Expectancy (years) |
|------------|-------------------------|
| Total | 78 |
| Males | 75 |
| Females | 80 |

Source: Xu et al., 2010.

For more information about the key study used to derive the recommended lifetime values, refer to **Chapter 18 of the *Exposure Factors Handbook*** at <http://www.epa.gov/ncea/efh/pdfs/efh-chapter18.pdf>. Detailed information on the key study on lifetime is included in Section 18.3.

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