

UNISEX LIFE EXPECTANCIES AT BIRTH AND AGE 65

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Life expectancies at birth and age 65 are shown in tables V.A3 and V.A4 of the 2004 Annual Report of the Board of Trustees. The life expectancies in those tables are presented on both a period and a cohort basis, separately, for males and females. This note provides the corresponding unisex life expectancies, and a brief explanation of their calculation method.

The following standard actuarial functions¹ are used in this note:

\dot{e}_x = the average number of years of life remaining at exact age x

l_x = the number of persons surviving to exact age x

l_0 = the starting number of persons in life table at age 0 (radix)

Additionally, a second subscript is used to denote gender where the letters u , m , and f represent unisex, male, and female, respectively.

The Office of the Chief Actuary computes all unisex life table values from the corresponding male and female life tables based on the observation that there are approximately 1,050 males born for every 1,000 females each year.² Thus, a unisex life table is created by combining a male life table with radix³ 105,000 and a female life table with radix 100,000, and then rescaling the combined table to radix 100,000. Unisex life expectancy at birth is then 1.05 times male life expectancy at birth plus female life expectancy at birth, this sum divided by 2.05.

$$\dot{e}_{0,u} = \frac{1.05 \dot{e}_{0,m} + 1.00 \dot{e}_{0,f}}{2.05} \quad (1)$$

At a given age x , the unisex life expectancy may be calculated as⁴

$$\dot{e}_{x,u} = \frac{l_{x,m} \dot{e}_{x,m} + l_{x,f} \dot{e}_{x,f}}{l_{x,m} + l_{x,f}} \quad (2)$$

For the unisex life expectancy at birth, notice that Equation (2) reduces to Equation (1) for the case where $x = 0$, $l_{0,m} = 105,000$ and $l_{0,f} = 100,000$. For age 65, the unisex life expectancy is computed as⁴

$$\dot{e}_{65,u} = \frac{l_{65,m} \dot{e}_{65,m} + l_{65,f} \dot{e}_{65,f}}{l_{65,m} + l_{65,f}} \quad (3)$$

The tables on the following pages correspond to tables V.A3 and V.A4 of the 2004 Trustees Report. Table 1 presents historical and projected unisex life expectancies on a period basis (for the intermediate alternative, only) in the same format as table V.A3 of the Trustees Report. Similarly, table 2 shows the unisex life expectancies on a cohort basis in the same format as table V.A4 of the Trustees Report. Detailed versions of tables 1 and 2 which contain unisex life expectancies for all years from 1940-2080 are available for internet download.⁵ For the purpose of comparison and easy accessibility, gender specific life expectancies are included in tables 1 and 2.

¹ These actuarial functions are described in chapter IV of Actuarial Study Number 116, Life Tables for the United States Social Security Area 1900-2100. www.socialsecurity.gov/OACT/NOTES/as116/as116_IV.html

² See the National Vital Statistics Report, Volume 52, Number 10, page 8 for a description of the sex ratio.

³ The radix of a life table is defined as l_0 , and is selected to be an arbitrarily but generally large integer.

⁴ This equation is based on a male life table radix of 105,000 and a female life table radix of 100,000.

⁵ www.socialsecurity.gov/OACT/NOTES/an2004-2/index.html

Table 1.—Period Life Expectancies¹

Calendar Year	Unisex		Male		Female	
	At birth	At age 65	At birth	At age 65	At birth	At age 65
Historical Data:						
1940.	63.5	12.7	61.4	11.9	65.7	13.4
1945.	65.6	13.6	62.9	12.6	68.4	14.4
1950.	68.3	14.0	65.6	12.8	71.1	15.1
1955.	69.7	14.5	66.7	13.1	72.8	15.6
1960.	69.9	14.5	66.7	12.9	73.2	15.9
1965.	70.2	14.8	66.8	12.9	73.8	16.3
1970.	70.9	15.3	67.2	13.1	74.9	17.1
1975.	72.6	16.0	68.7	13.7	76.6	18.0
1980.	73.6	16.3	69.9	14.0	77.5	18.4
1985.	74.6	16.6	71.1	14.4	78.2	18.6
1990.	75.2	17.1	71.8	15.0	78.9	19.0
1991.	75.4	17.2	72.0	15.1	79.0	19.1
1992.	75.6	17.3	72.2	15.2	79.2	19.2
1993.	75.4	17.1	72.0	15.1	78.9	19.0
1994.	75.6	17.2	72.3	15.3	79.0	19.0
1995.	75.7	17.2	72.5	15.3	79.0	19.0
1996.	76.0	17.3	72.9	15.4	79.2	19.0
1997.	76.3	17.3	73.4	15.5	79.3	19.1
1998.	76.4	17.4	73.7	15.6	79.4	19.0
1999.	76.5	17.3	73.8	15.7	79.3	18.9
2000.	76.6	17.4	74.0	15.8	79.4	18.9
2001 ²	76.7	17.5	74.1	15.9	79.4	18.9
2002 ²	76.8	17.5	74.3	16.0	79.5	18.9
2003 ²	76.9	17.5	74.4	16.0	79.5	19.0
Projected:³						
2005.	77.1	17.6	74.7	16.1	79.6	19.0
2010.	77.6	17.8	75.3	16.4	80.0	19.1
2015.	78.0	18.1	75.8	16.7	80.4	19.4
2020.	78.5	18.4	76.3	17.1	80.8	19.7
2025.	79.0	18.7	76.9	17.4	81.3	20.0
2030.	79.5	19.0	77.4	17.7	81.7	20.3
2035.	79.9	19.3	77.8	18.0	82.1	20.6
2040.	80.4	19.6	78.3	18.2	82.5	20.9
2045.	80.8	19.9	78.8	18.5	82.9	21.2
2050.	81.2	20.1	79.2	18.8	83.3	21.4
2055.	81.6	20.4	79.6	19.1	83.6	21.7
2060.	82.0	20.6	80.0	19.3	84.0	22.0
2065.	82.3	20.9	80.4	19.6	84.3	22.2
2070.	82.7	21.2	80.8	19.9	84.6	22.5
2075.	83.0	21.4	81.2	20.1	85.0	22.7
2080.	83.4	21.6	81.6	20.3	85.3	22.9

¹ The period life expectancy at a given age for a given year represents the average number of years of life remaining if a group of persons at that age were to experience the mortality rates for the year over the course of their remaining lives.

² Preliminary or estimated.

³ The projected values are based on the intermediate assumptions of the 2004 Trustees Report.

Table 2.—Cohort Life Expectancies¹

Calendar Year	Unisex		Male		Female	
	At birth ²	At age 65 ³	At birth ²	At age 65 ³	At birth ²	At age 65 ³
1940	72.5	13.8	69.5	12.7	75.8	14.7
1945	74.1	14.3	71.1	13.0	77.3	15.4
1950	75.3	14.7	72.3	13.1	78.5	16.2
1955	76.0	15.1	73.1	13.1	79.1	16.7
1960	76.6	15.5	73.8	13.2	79.6	17.4
1965	77.3	15.9	74.6	13.5	80.2	18.0
1970	78.3	16.4	75.7	13.8	81.0	18.5
1975	79.1	16.7	76.6	14.2	81.7	18.7
1980	79.8	16.9	77.5	14.7	82.3	18.7
1985	80.5	17.1	78.1	15.2	82.9	18.8
1990	81.0	17.4	78.8	15.6	83.4	19.0
1991	81.1	17.4	78.9	15.7	83.5	19.0
1992	81.2	17.5	79.0	15.8	83.6	19.0
1993	81.3	17.6	79.1	15.9	83.6	19.1
1994	81.4	17.6	79.2	16.0	83.7	19.1
1995	81.6	17.7	79.4	16.0	83.9	19.1
1996	81.7	17.7	79.5	16.1	83.9	19.2
1997	81.8	17.8	79.6	16.2	84.0	19.2
1998	81.8	17.9	79.7	16.3	84.1	19.3
1999	81.9	17.9	79.8	16.4	84.2	19.3
2000	82.0	18.0	79.9	16.5	84.3	19.4
2001	82.1	18.1	80.0	16.6	84.3	19.4
2002	82.2	18.1	80.1	16.6	84.4	19.5
2003	82.3	18.2	80.2	16.7	84.5	19.5
2005	82.5	18.3	80.4	16.8	84.7	19.7
2010	82.9	18.6	80.8	17.2	85.0	20.0
2015	83.3	18.9	81.3	17.5	85.4	20.3
2020	83.6	19.2	81.7	17.8	85.7	20.6
2025	84.0	19.5	82.1	18.1	86.0	20.9
2030	84.4	19.8	82.5	18.4	86.4	21.2
2035	84.7	20.1	82.8	18.7	86.7	21.5
2040	85.0	20.4	83.2	19.0	87.0	21.7
2045	85.4	20.6	83.5	19.3	87.3	22.0
2050	85.7	20.9	83.9	19.5	87.6	22.3
2055	86.0	21.2	84.2	19.8	87.8	22.5
2060	86.3	21.4	84.5	20.1	88.1	22.8
2065	86.6	21.7	84.9	20.3	88.4	23.0
2070	86.8	21.9	85.2	20.6	88.6	23.3
2075	87.1	22.1	85.5	20.8	88.9	23.5
2080	87.4	22.4	85.8	21.1	89.1	23.7

¹ The cohort life expectancy at a given age for a given year represents the average number of years of life remaining if a group of persons at that age were to experience the mortality rates for the series of years in which they reach each succeeding age. All mortality rates are consistent with those used for the intermediate assumptions of the 2004 Trustees Report.

² Cohort life expectancies at birth are based on a combination of actual and projected data for birth years prior to 2001. For birth years after 2000, these values are based on projected data.

³ Age 65 cohort life expectancies are based on actual data prior to 1970. For 1970 through 2000, these values are based on a combination of actual and projected data. After 2000, these values are based on projected data.