United States Life Tables, 2018

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Abstract

Objectives—This report presents complete period life tables for the United States by Hispanic origin, race, and sex, based on age-specific death rates in 2018.

Methods—Data used to prepare the 2018 life tables are 2018 final mortality statistics; July 1, 2018 population estimates based on the 2010 decennial census; and 2018 Medicare data for persons aged 66–99. The methodology used to estimate the life tables for the Hispanic population remains unchanged from that developed for the publication of life tables by Hispanic origin for data year 2006. The methodology used to estimate the 2018 life tables for all other groups was first implemented with data year 2008. In 2018, all 50 states and the District of Columbia reported deaths by race based on the 1997 Office of Management and Budget revised standards for the classification of federal data on race and ethnicity. As a result, race-specific life tables for 2018 presented in this report are based on the new standard and show estimates for single-race groups. These estimates are not completely comparable with those of previous years, which are based on bridged-race groups. To show trends and document the impact of changing to the 1997 standards, life expectancy estimates for 2006–2018 are reported for bridged-race categories that were in use starting with data year 2000.

Results—In 2018, the overall expectation of life at birth was 78.7 years, increasing from 78.6 in 2017. Between 2017 and 2018, life expectancy at birth increased by 0.1 year for males (76.1 to 76.2) and females (81.1 to 81.2). In 2018, life expectancy at birth was 81.8 for the Hispanic population, 78.6 for the non-Hispanic single-race white population, and 74.7 for the non-Hispanic single-race black population.

Keywords: life expectancy • survival • death rates • Hispanic origin • race • National Vital Statistics System

Introduction

There are two types of life tables: the cohort (or generation) life table and the period (or current) life table. The cohort life table presents the mortality experience of a particular birth cohort—all persons born in the year 1900, for example—from the moment of birth through consecutive ages in successive calendar years. Based on age-specific death rates observed through consecutive calendar years, the cohort life table reflects the mortality experience of an actual cohort from birth until no lives remain in the group. To prepare just a single complete cohort life table requires data over many years. It is usually not feasible to construct cohort life tables entirely on the basis of observed data for real cohorts due to data unavailability or incompleteness (1). For example, a life table representation of the mortality experience of a cohort of persons born in 1970 would require the use of data projection techniques to estimate deaths into the future (2,3).

Unlike the cohort life table, the period life table does not represent the mortality experience of an actual birth cohort. Rather, the period life table presents what would happen to a hypothetical cohort if it experienced throughout its entire life the mortality conditions of a particular period in time. For example, a period life table for 2018 assumes a hypothetical cohort that is subject throughout its lifetime to the age-specific death rates prevailing for the actual population in 2018. The period life table may thus be characterized as rendering a "snapshot" of current mortality experience and shows the long-range implications of a set of age-specific death rates that prevailed in a given year. In this report the term "life table" refers only to the period life table and not to the cohort life table.

Life tables can be classified in two ways according to the length of the age interval in which data are presented. A complete life table contains data for every single year of age. An abridged life table typically contains data by 5- or 10-year age intervals. A complete life table can easily be aggregated into 5- or 10-year age groups (see Technical Notes for instructions). Other than the decennial life tables, U.S. life tables based on data before 1997

are abridged life tables constructed by reference to a standard table (4).

Beginning with the 2018 data year, all 50 states and the District of Columbia reported deaths based on the 2003 revision of the U.S. Standard Certificate of Death for the entire year (5). The revision is based on the 1997 Office of Management and Budget (OMB) revised standards for the classification of federal data on race and ethnicity (6). The 1997 standard allows individuals to report more than one race and increased the race choices from four to five by separating the Asian and Pacific Islander groups. The Hispanic category remained consistent with previous publications. The new categories included in this report are Hispanic, non-Hispanic single-race white, and non-Hispanic single-race black. These categories differ from the bridged-race categories shown in previous reports. Life expectancy estimates for bridged-race categories are included in this report for years 2006–2018 to document the effect of the change in race standards and show trends. Estimates for bridged-race categories will continue to be calculated through data year 2020; see Technical Notes and "Comparability of race-specific mortality data based on 1977 versus 1997 reporting standard" for more information on differences between single- and bridged-race groups (7).

This report presents complete period life tables by sex for the Hispanic, non-Hispanic single-race white, and non-Hispanic single-race black populations based on the 1997 OMB revised standards for the reporting of race and ethnicity. For years 2000–2017, multiple-race mortality data were bridged to single-race categories based on the 1977 OMB standards for the classification of race and ethnicity (8). As a result, single-race categories based on the 1997 standards are not completely comparable with those based on the 1977 standards. Comparisons between data years 2000–2017 and 2018 should be interpreted taking these differences into account. In this report, life expectancy for 2018 by race is calculated for both single- and bridged-race groups to illustrate the impact of the transition to the 1997 standards. The Hispanic category is consistent with previous reports because the classification of Hispanic origin did not change between standards (6,8). In the remainder of this report, "race" refers to "single race" based on the 1997 standard.

Data and Methods

The data used to prepare the U.S. life tables for 2018 are final numbers of deaths for the year 2018; July 1, 2018 population estimates based on the 2010 decennial census; and age-specific death and population counts for Medicare beneficiaries aged 66–99 for the year 2018 from the Centers for Medicare & Medicaid Services. Data from the Medicare program are used to supplement vital statistics and census data for ages 66 and over. The U.S. life tables by Hispanic origin are based on death rates that have been adjusted for race and ethnicity misclassification on death certificates using classification ratios (or correction factors) generated from an updated evaluation of Hispanic origin and race misclassification on death certificates in the United States (9). (See Technical Notes for a detailed

description of the data sets and methodology used to estimate Hispanic origin life tables).

In 2018, all 50 states and the District of Columbia reported deaths by race based on the 1997 Office of Management and Budget revised standards for the classification of federal data on race and ethnicity. The 1997 standards allow individuals to report more than one race and increased the race choices from four to five by separating the Asian and Pacific Islander groups. Hispanic origin did not change between standards (6). The Hispanic origin and race categories included in this report include Hispanic, non-Hispanic single-race white, and non-Hispanic single-race black; see Technical Notes and race report (title forthcoming) for more information on differences in mortality between single- and bridged-race groups (7).

Expectation of life

The most frequently used life table statistic is life expectancy (e_x), which is the average number of years of life remaining for persons who have attained a given age (x). Life expectancy and other life table values for each age in 2018 are shown for the total population and by Hispanic origin, race, and sex in Tables 1–12. Life expectancy is summarized by age, Hispanic origin, race, and sex in Table A.

Life expectancy at birth (e_0) for 2018 for the total population was 78.7 years. This represents the average number of years that the members of the hypothetical life table cohort can expect to live at the time of birth (Table A).

Survivors to specified ages

Another way of assessing the longevity of the period life table cohort is by determining the proportion that survives to specified ages. The l_x column of the life table provides the data for computing this proportion. Table B summarizes the number of survivors by age, Hispanic origin, race, and sex. To illustrate, 58,141 persons out of the original 2018 hypothetical life table cohort of 100,000 (or 58.1%) were alive at exact age 80. In other words, the probability that a person will survive from birth to age 80, given 2018 age-specific mortality, is 58.1%. Probabilities of survival can be calculated at any age by simply dividing the number of survivors at the terminal age by the number at the beginning age. For example, to calculate the probability of surviving from age 20 to age 85, one would divide the number of survivors at age 85 (42,800) by the number of survivors at age 20 (98,964), which results in a 43.2% probability of survival.

Explanation of the columns of the life table

Column 1. Age (between x and $x + 1$)—Shows the age interval between the two exact ages indicated. For instance, "20–21" means the 1-year interval between the 20th and 21st birthdays.

Column 2. Probability of dying (q_x)—Shows the probability of dying between ages x and $x + 1$. For example, for males in the age interval 20–21 years, the probability of dying is 0.001082 (Table 2). This column forms the basis of the life table; all subsequent columns are derived from it.

Table A. Expectation of life, by age, Hispanic origin, race for the non-Hispanic population, and sex: United States, 2018

Age	All origins			Hispanic[1]			Non-Hispanic white[1]			Non-Hispanic black[1]		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
0.	78.7	76.2	81.2	81.8	79.1	84.3	78.6	76.2	81.1	74.7	71.3	78.0
1.	78.2	75.7	80.7	81.2	78.5	83.7	78.0	75.6	80.4	74.5	71.2	77.7
5.	74.3	71.8	76.7	77.3	74.6	79.8	74.1	71.7	76.5	70.7	67.3	73.8
10.	69.3	66.8	71.8	72.3	69.6	74.8	69.1	66.7	71.5	65.7	62.4	68.9
15.	64.3	61.9	66.8	67.4	64.6	69.9	64.1	61.8	66.6	60.8	57.4	64.0
20.	59.5	57.1	61.9	62.5	59.8	64.9	59.3	57.0	61.6	56.0	52.8	59.1
25.	54.8	52.4	57.0	57.7	55.1	60.1	54.5	52.3	56.8	51.4	48.3	54.3
30.	50.1	47.8	52.2	53.0	50.5	55.2	49.9	47.7	52.0	46.9	43.9	49.5
35.	45.4	43.3	47.5	48.2	45.8	50.3	45.2	43.2	47.3	42.3	39.5	44.8
40.	40.8	38.7	42.7	43.5	41.2	45.5	40.6	38.7	42.6	37.8	35.1	40.2
45.	36.2	34.2	38.1	38.8	36.5	40.7	36.1	34.2	37.9	33.5	30.9	35.7
50.	31.7	29.9	33.5	34.2	32.0	36.0	31.6	29.8	33.3	29.2	26.7	31.4
55.	27.4	25.7	29.0	29.8	27.7	31.4	27.3	25.7	28.9	25.2	22.9	27.2
60.	23.3	21.8	24.8	25.5	23.6	27.0	23.3	21.7	24.7	21.4	19.3	23.2
65.	19.5	18.1	20.7	21.4	19.7	22.7	19.4	18.1	20.6	18.0	16.1	19.5
70.	15.8	14.6	16.8	17.5	16.0	18.6	15.7	14.5	16.6	14.9	13.3	16.0
75.	12.3	11.3	13.1	13.9	12.6	14.7	12.2	11.3	13.0	11.9	10.5	12.7
80.	9.2	8.4	9.8	10.5	9.4	11.1	9.1	8.4	9.7	9.2	8.1	9.8
85.	6.6	6.0	7.0	7.6	6.7	8.0	6.5	5.9	6.9	6.9	6.1	7.3
90.	4.5	4.1	4.8	5.3	4.6	5.5	4.5	4.0	4.7	5.0	4.5	5.2
95.	3.1	2.8	3.2	3.6	3.1	3.7	3.0	2.7	3.1	3.7	3.3	3.7
100.	2.2	2.0	2.2	2.5	2.2	2.5	2.1	1.9	2.2	2.7	2.5	2.7

[1]Life tables by Hispanic origin are based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table B. Number of survivors out of 100,000 born alive, by age, Hispanic origin, race for the non-Hispanic population, and sex: United States, 2018

Age	All origins			Hispanic[1]			Non-Hispanic white[1]			Non-Hispanic black[1]		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
0.	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
1.	99,435	99,379	99,494	99,515	99,468	99,516	99,538	99,492	99,586	98,927	98,801	99,058
5.	99,339	99,269	99,412	99,440	99,385	99,450	99,449	99,382	99,519	98,753	98,615	98,917
10.	99,282	99,207	99,360	99,397	99,342	99,407	99,397	99,321	99,478	98,644	98,505	98,822
15.	99,208	99,124	99,296	99,335	99,276	99,351	99,327	99,232	99,426	98,524	98,383	98,719
20.	98,964	98,785	99,151	99,138	99,013	99,223	99,093	98,918	99,277	98,115	97,764	98,528
25.	98,519	98,144	98,913	98,772	98,478	99,041	98,656	98,309	99,024	97,406	96,695	98,193
30.	97,946	97,345	98,578	98,326	97,830	98,816	98,057	97,486	98,659	96,582	95,528	97,726
35.	97,254	96,425	98,122	97,841	97,168	98,530	97,300	96,491	98,150	95,585	94,178	97,073
40.	96,408	95,335	97,527	97,247	96,357	98,170	96,387	95,325	97,500	94,320	92,528	96,170
45.	95,368	94,037	96,747	96,518	95,379	97,703	95,287	93,969	96,663	92,681	90,457	94,928
50.	93,890	92,225	95,606	95,445	94,007	96,947	93,747	92,111	95,454	90,493	87,775	93,195
55.	91,673	89,528	93,872	93,788	91,932	95,732	91,485	89,388	93,665	87,321	83,939	90,643
60.	88,371	85,497	91,298	91,295	88,766	93,926	88,160	85,355	91,061	82,692	78,365	86,900
65.	83,827	79,949	87,747	87,711	84,229	91,267	83,650	79,887	87,525	76,289	70,644	81,714
70.	77,833	72,825	82,867	82,883	78,224	87,518	77,720	72,890	82,674	68,215	60,971	75,080
75.	69,629	63,633	75,660	76,067	70,077	81,888	69,476	63,697	75,406	58,640	50,304	66,516
80.	58,141	51,305	65,003	66,338	59,138	73,153	57,857	51,272	64,596	46,947	37,967	55,395
85.	42,800	35,806	49,763	52,329	44,222	59,648	42,363	35,600	49,210	33,343	24,880	41,225
90.	24,923	18,995	30,654	34,228	26,303	40,784	24,403	18,684	30,026	19,364	12,922	25,314
95.	9,530	6,219	12,591	15,836	10,276	19,803	9,101	5,921	12,068	8,249	4,732	11,357
100.	1,921	1,003	2,727	4,262	2,129	5,482	1,750	892	2,507	2,269	1,077	3,218

[1]Life tables by Hispanic origin are based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Column 3. Number surviving (l_x)—Shows the number of persons from the original hypothetical cohort of 100,000 live births who survive to the beginning of each age interval. The l_x values are computed from the q_x values, which are successively applied to the remainder of the original 100,000 persons still alive at the beginning of each age interval. Thus, out of 100,000 female babies born alive, 99,494 will complete the first year of life and enter the second; 99,360 will reach age 10; 99,151 will reach age 20; and 49,763 will live to age 85 (Table 3).

Column 4. Number dying (d_x)—Shows the number dying in each successive age interval out of the original 100,000 live births. For example, out of 100,000 males born alive, 621 will die in the first year of life; 107 between ages 20 and 21; and 1,003 after reaching age 100 (Table 2). Each figure in column 4 is the difference between two successive figures in column 3.

Column 5. Person-years lived (L_x)—Shows the number of person-years lived by the hypothetical life table cohort within an age interval x to $x + 1$. Each figure in column 5 represents the total time (in years) lived between two indicated birthdays by all those reaching the earlier birthday. Thus, the figure 98,732 for males in the age interval 20–21 is the total number of years lived between the 20th and 21st birthdays by the 98,785 males (column 3) who reached their 20th birthday out of 100,000 males born alive (Table 2).

Column 6. Total number of person-years lived (T_x)—Shows the total number of person-years that would be lived after the beginning of the age interval x to $x + 1$ by the hypothetical life table cohort. For example, the figure 5,638,574 is the total number of years lived after attaining age 20 by the 98,785 males reaching that age (Table 2).

Column 7. Expectation of life (e_x)—The expectation of life at any given age is the average number of years remaining to be lived by those surviving to that age, based on a given set of age-specific rates of dying. It is derived by dividing the total person-years that would be lived beyond age x by the number of persons who survived to that age interval (T_x/l_x). Thus, the average remaining lifetime for males who reach age 20 is 57.1 years (5,648,574 divided by 98,785) (Table 2).

Results

Life expectancy in the United States

Tables 1–12 show complete life tables for 2018 by Hispanic origin, race, and sex. Table A summarizes life expectancy by age, Hispanic origin, race, and sex. Life expectancy at birth for 2018 represents the average number of years that a group of infants would live if they were to experience throughout life the age-specific death rates in 2018. In 2018, life expectancy at birth was 78.7 years, increasing by 0.1 year from 78.6 in 2017 (Table 13).

The difference in life expectancy between the sexes was 5.0 years in 2018, which was unchanged from 2017. From 1900 through 1975, the difference in life expectancy between the sexes increased from 2.0 years to 7.8 years (Figure 1 and Table 13). The increasing gap during these years is attributed to increases in male mortality due to ischemic heart disease and lung cancer, both of which increased largely as the result of men's early and widespread adoption of cigarette smoking (10,11). Between 1979 and 2010, the difference in life expectancy between the sexes narrowed from 7.8 years to 4.8 years and then increased to 5.0 in 2017 (Figure 1 and Table 13).

The 2018 life table may be used to compare life expectancy at any age from birth onward. On the basis of mortality experienced in 2018, a person aged 65 could expect to live an average of 19.5 more years, for a total of 84.5 years; a person aged 85 could expect to live an additional 6.6 years, for a total of 91.6 years; and a person aged 100 could expect to live an additional 2.2 years, on average (Table A).

Changes in mortality by age and cause of death can have a major effect on life expectancy. Life expectancy between 2017 and 2018 increased due to decreases in mortality from cancer, unintentional injuries, Chronic lower respiratory diseases, heart disease, homicide, and increases in mortality from Influenza and pneumonia, suicide, Nutritional deficiencies, Chronic liver disease and cirrhosis, and Parkinson disease. For males, life expectancy increased due to decreases in mortality from unintentional injuries, cancer, homicide, Chronic lower respiratory diseases, Viral hepatitis, and increases in mortality from Influenza and pneumonia, suicide, Chronic liver disease and cirrhosis, kidney disease, and Nutritional deficiencies. For females, life expectancy increased due to decreases in mortality from cancer, unintentional injuries, heart disease, Chronic lower respiratory diseases, stroke, and increases in mortality from Influenza and pneumonia, Nutritional deficiencies, suicide, Parkinson disease, and Chronic liver disease and cirrhosis (5).

Life expectancy by Hispanic origin and race

Among the six Hispanic-origin and race–sex groups (Figure 2), Hispanic females have the highest life expectancy at birth (84.3 years), followed by non-Hispanic white females (81.1), Hispanic males (79.1), non-Hispanic black females (78.0), non-Hispanic white males (76.2), and non-Hispanic black males (71.3). The smallest difference is between Hispanic males and non-Hispanic black females, with Hispanic males having an advantage of 1.1 years. The largest difference is between Hispanic females and non-Hispanic black males, with Hispanic females having a life expectancy at birth 13.0 years greater.

Life expectancy did not change from 2017 to 2018 for the total (81.8), male (79.1), and female (84.3) Hispanic populations (Figure 3 and Table 13). Since 2006, when life tables by Hispanic origin were added to the U.S. life table program, life expectancy at birth increased by 1.6 years (77.5 to 79.1) for Hispanic males, 1.5 years (80.3 to 81.8) for the total Hispanic population, and 1.4 years (82.9 to 84.3) for Hispanic females (Figure 3). Changes in life expectancy between 2017 and 2018 for the non-Hispanic white and non-Hispanic black populations are discussed below in the section "Effects of the transition to the 1997 race standard on life expectancy."

Survivorship in the United States

Table B summarizes the number of survivors out of 100,000 persons born alive (l_x) by age, Hispanic origin, race, and sex for 2018. In 2018, 99.4% of all infants born in the United States survived the first year of life; 99.0% survived to age 20; 83.8%

Figure 1. Life expectancy, by sex: United States, 1900–2018

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.
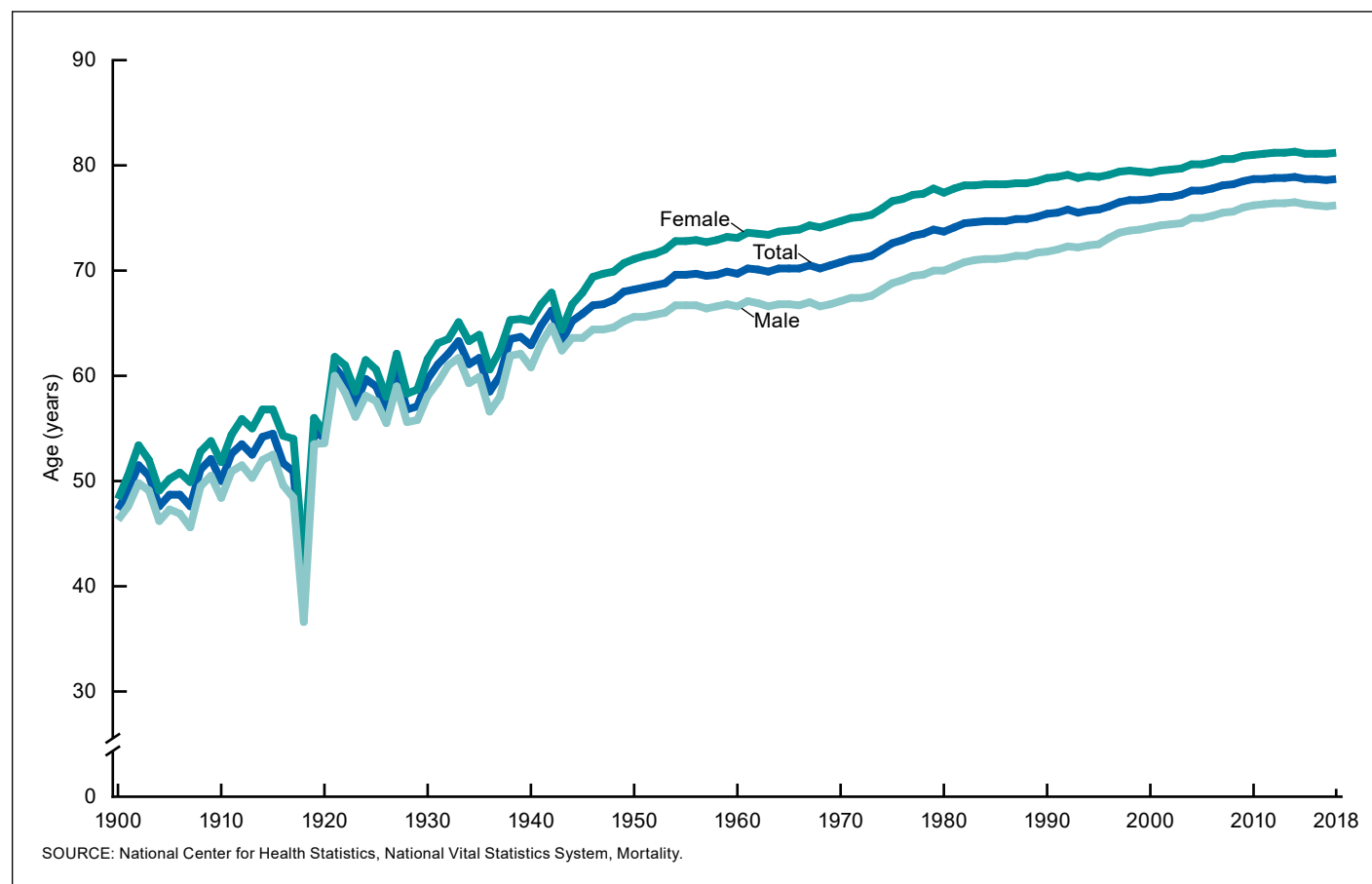
survived to age 65; 42.8% survived to age 85; and 1.9% survived to age 100.

Survivorship by Hispanic origin and race

In 2018, 99.5% of Hispanic and non-Hispanic white infants survived the first year of life, compared with 98.9% of non-Hispanic black infants (Figure 4 and Table B). For both the Hispanic and non-Hispanic white populations, 99.1% survived to age 20; 98.1% of the non-Hispanic black population survived to age 20. By age 65, the Hispanic population has a clear survival advantage compared with the other two populations. Overall, 87.7% of the Hispanic population survived to age 65, compared with 83.7% of the non-Hispanic white and 76.3% of the non-Hispanic black populations. The Hispanic survival advantage increases with age so that by age 85, 52.3% of the Hispanic population has survived compared with 42.4% of the non-Hispanic white and 33.3% of the non-Hispanic black populations.

Effects of the transition to the 1997 race standard on life expectancy

Table C presents life expectancy at select ages by sex for the non-Hispanic white and non-Hispanic black populations based on bridged race and the 1997 single-race standard in 2018. Single-race life expectancy at birth was lower by 0.1 year than bridged-

race life expectancy for the non-Hispanic white population and by 0.2 year for the non-Hispanic black population. There were no differences in life expectancy between the two race standards at any other ages or by sex for the non-Hispanic white population. Among the non-Hispanic black population, life expectancy at birth for single race was 0.2 and 0.1 year lower for males and females, respectively. Life expectancy at age 65 for single race was lower than bridged race by 0.1 year for both non-Hispanic black males and females.

Based on bridged race, life expectancy at birth increased by 0.2 year for the total non-Hispanic white population and by 0.1 year for non-Hispanic white males and females between 2017 and 2018 (Table 13). For the non-Hispanic black population, life expectancy at birth by bridged race did not change for the total or either males or females between 2017 and 2018. The effects of transitioning from bridged race to single race was to reduce the 0.2 year increase in life expectancy to 0.1 year for the non-Hispanic white population. For the non-Hispanic black population, the transition led to a decline in life expectancy of 0.2 year from no change between 2017 and 2018.

Figure 2. Life expectancy at birth, by Hispanic origin and race and sex: United States, 2018

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.
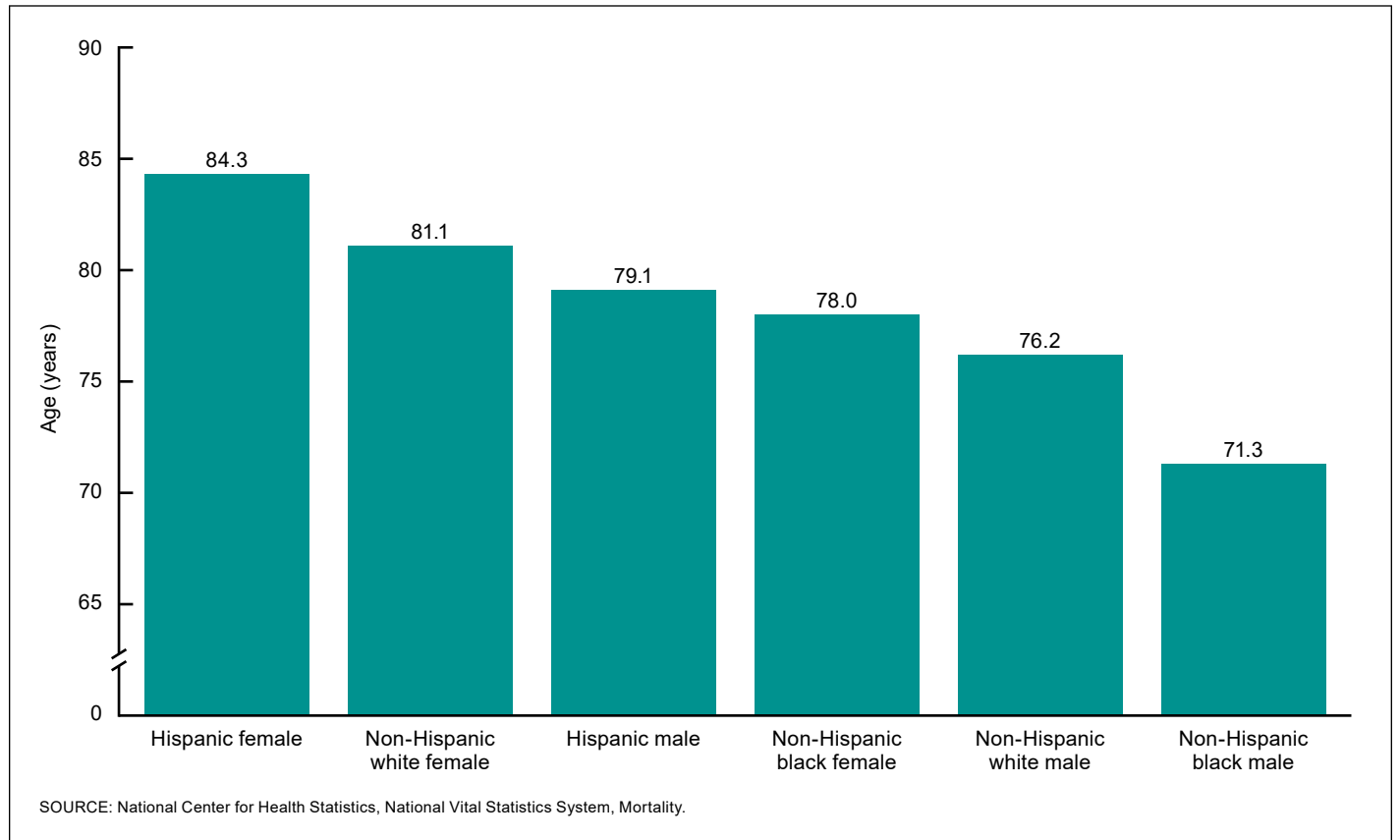
Figure 3. Life expectancy at birth among the Hispanic population, by sex: United States, 2006–2018

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.
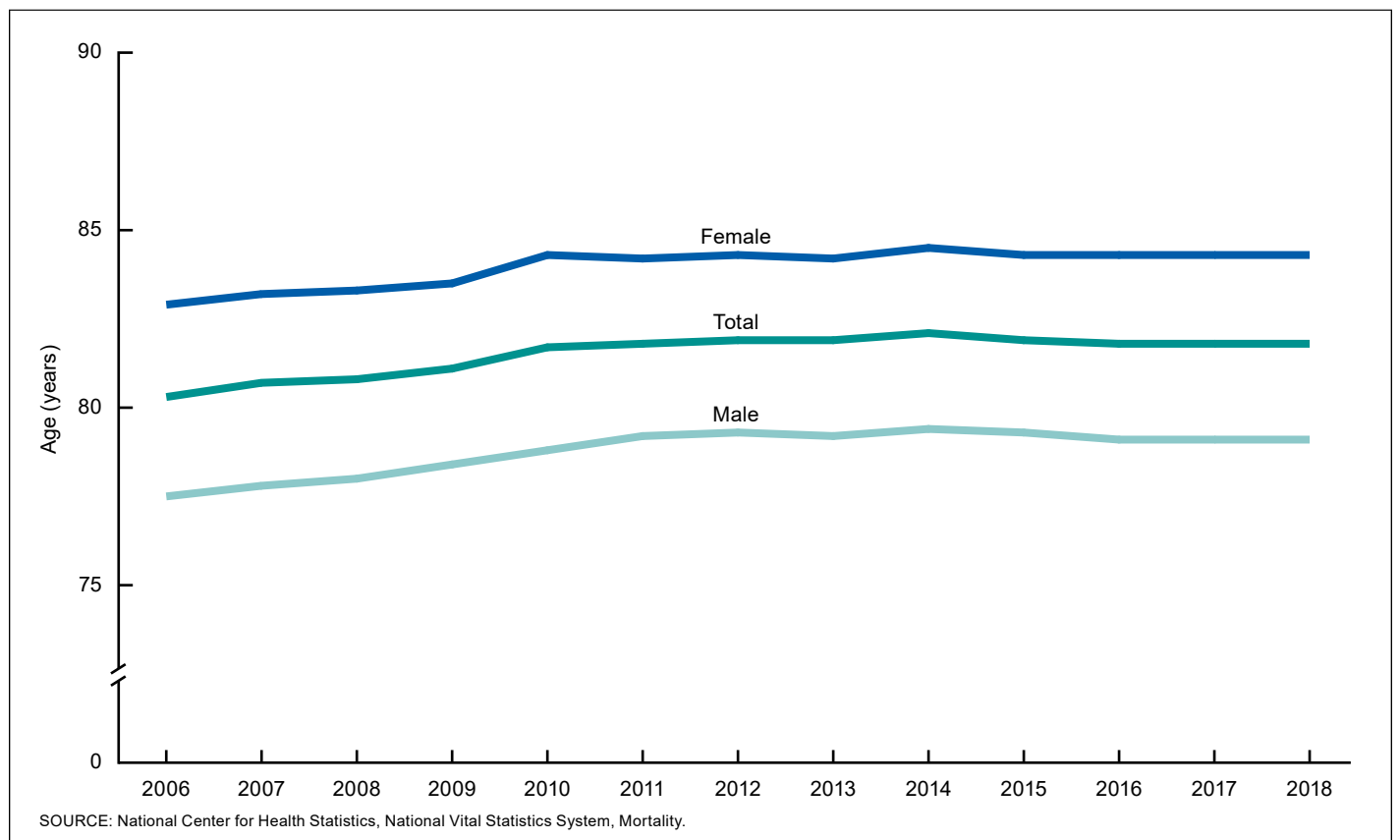
Figure 4. Percentage surviving, by Hispanic origin and race, age, and sex: United States, 2018

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.
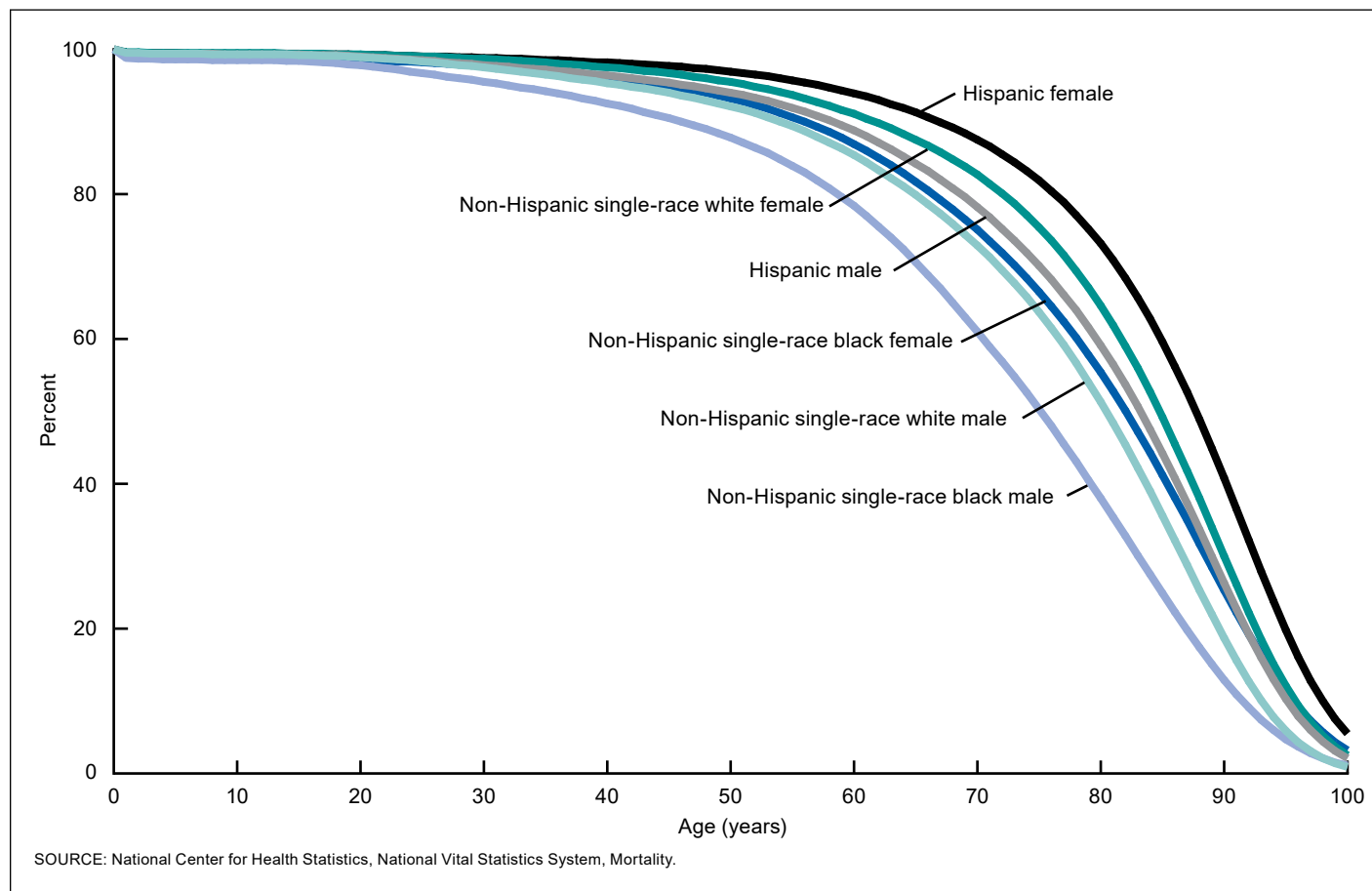
Table C. Comparison of life expectancy at selected ages between bridged-race and single-race standards: United States, 2018

Race for non-Hispanic population and age	Total		Male		Female	
	Bridged race[1]	Single race[2]	Bridged race[1]	Single race[2]	Bridged race[1]	Single race[2]
Non-Hispanic white						
0.	78.7	78.6	76.2	76.2	81.1	81.1
65.	19.4	19.4	18.1	18.1	20.6	20.6
85.	6.5	6.5	5.9	5.9	6.9	6.9
100.	2.1	2.1	1.9	1.9	2.2	2.2
Non-Hispanic black						
0.	74.9	74.7	71.5	71.3	78.1	78.0
65.	18.1	18.0	16.2	16.1	19.6	19.5
85.	6.9	6.9	6.1	6.1	7.3	7.3
100.	2.7	2.7	2.5	2.5	2.7	2.7

[1]Race categories are consistent with 1977 Office of Management and Budget (OMB) standards.
[2]Race categories are consistent with 1997 OMB standards.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

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List of Detailed Tables

Table 1. Life table for the total population: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table01.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1.	0.005650	100,000	565	99,505	7,873,749	78.7
1–2.	0.000367	99,435	36	99,417	7,774,244	78.2
2–3.	0.000264	99,399	26	99,385	7,674,827	77.2
3–4.	0.000187	99,372	19	99,363	7,575,442	76.2
4–5.	0.000148	99,354	15	99,346	7,476,079	75.2
5–6.	0.000142	99,339	14	99,332	7,376,732	74.3
6–7.	0.000126	99,325	13	99,319	7,277,400	73.3
7–8.	0.000114	99,312	11	99,307	7,178,082	72.3
8–9.	0.000103	99,301	10	99,296	7,078,775	71.3
9–10.	0.000094	99,291	9	99,286	6,979,479	70.3
10–11.	0.000091	99,282	9	99,277	6,880,192	69.3
11–12.	0.000100	99,273	10	99,268	6,780,915	68.3
12–13.	0.000128	99,263	13	99,256	6,681,648	67.3
13–14.	0.000179	99,250	18	99,241	6,582,391	66.3
14–15.	0.000248	99,232	25	99,220	6,483,150	65.3
15–16.	0.000325	99,208	32	99,192	6,383,930	64.3
16–17.	0.000405	99,175	40	99,155	6,284,739	63.4
17–18.	0.000489	99,135	49	99,111	6,185,583	62.4
18–19.	0.000575	99,087	57	99,058	6,086,473	61.4
19–20.	0.000661	99,030	65	98,997	5,987,414	60.5
20–21.	0.000750	98,964	74	98,927	5,888,417	59.5
21–22.	0.000837	98,890	83	98,849	5,789,490	58.5
22–23.	0.000915	98,807	90	98,762	5,690,642	57.6
23–24.	0.000978	98,717	97	98,669	5,591,880	56.6
24–25.	0.001029	98,620	101	98,570	5,493,211	55.7
25–26.	0.001075	98,519	106	98,466	5,394,642	54.8
26–27.	0.001120	98,413	110	98,358	5,296,176	53.8
27–28.	0.001164	98,303	114	98,245	5,197,818	52.9
28–29.	0.001209	98,188	119	98,129	5,099,573	51.9
29–30.	0.001256	98,070	123	98,008	5,001,444	51.0
30–31.	0.001306	97,946	128	97,882	4,903,436	50.1
31–32.	0.001357	97,818	133	97,752	4,805,553	49.1
32–33.	0.001414	97,686	138	97,617	4,707,801	48.2
33–34.	0.001475	97,548	144	97,476	4,610,185	47.3
34–35.	0.001538	97,404	150	97,329	4,512,709	46.3
35–36.	0.001610	97,254	157	97,176	4,415,380	45.4
36–37.	0.001686	97,097	164	97,015	4,318,205	44.5
37–38.	0.001753	96,934	170	96,849	4,221,189	43.5
38–39.	0.001809	96,764	175	96,676	4,124,340	42.6
39–40.	0.001864	96,589	180	96,499	4,027,664	41.7
40–41.	0.001930	96,408	186	96,315	3,931,166	40.8
41–42.	0.002020	96,222	194	96,125	3,834,850	39.9
42–43.	0.002139	96,028	205	95,925	3,738,725	38.9
43–44.	0.002289	95,823	219	95,713	3,642,800	38.0
44–45.	0.002462	95,603	235	95,486	3,547,087	37.1
45–46.	0.002654	95,368	253	95,241	3,451,601	36.2
46–47.	0.002863	95,115	272	94,979	3,356,359	35.3
47–48.	0.003091	94,843	293	94,696	3,261,381	34.4
48–49.	0.003347	94,549	316	94,391	3,166,685	33.5
49–50.	0.003638	94,233	343	94,062	3,072,293	32.6
50–51.	0.003950	93,890	371	93,705	2,978,232	31.7
51–52.	0.004297	93,519	402	93,318	2,884,527	30.8
52–53.	0.004709	93,118	438	92,898	2,791,209	30.0
53–54.	0.005186	92,679	481	92,439	2,698,310	29.1
54–55.	0.005701	92,198	526	91,936	2,605,872	28.3
55–56.	0.006223	91,673	571	91,388	2,513,936	27.4
56–57.	0.006744	91,102	614	90,795	2,422,548	26.6
57–58.	0.007281	90,488	659	90,158	2,331,753	25.8
58–59.	0.007848	89,829	705	89,477	2,241,595	25.0
59–60.	0.008454	89,124	753	88,747	2,152,118	24.1

Table 1. Life table for the total population: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table01.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61.	0.009109	88,371	805	87,968	2,063,371	23.3
61–62.	0.009795	87,566	858	87,137	1,975,403	22.6
62–63.	0.010492	86,708	910	86,253	1,888,266	21.8
63–64.	0.011192	85,798	960	85,318	1,802,013	21.0
64–65.	0.011915	84,838	1,011	84,333	1,716,695	20.2
65–66.	0.012691	83,827	1,064	83,295	1,632,362	19.5
66–67.	0.013610	82,763	1,126	82,200	1,549,067	18.7
67–68.	0.014606	81,637	1,192	81,041	1,466,867	18.0
68–69.	0.015724	80,444	1,265	79,812	1,385,826	17.2
69–70.	0.017004	79,180	1,346	78,506	1,306,014	16.5
70–71.	0.018391	77,833	1,431	77,117	1,227,508	15.8
71–72.	0.019831	76,402	1,515	75,644	1,150,390	15.1
72–73.	0.021913	74,887	1,641	74,066	1,074,746	14.4
73–74.	0.023804	73,246	1,744	72,374	1,000,680	13.7
74–75.	0.026193	71,502	1,873	70,566	928,306	13.0
75–76.	0.028692	69,629	1,998	68,630	857,740	12.3
76–77.	0.031786	67,631	2,150	66,557	789,110	11.7
77–78.	0.035136	65,482	2,301	64,331	722,553	11.0
78–79.	0.038673	63,181	2,443	61,959	658,222	10.4
79–80.	0.042747	60,738	2,596	59,439	596,263	9.8
80–81.	0.047201	58,141	2,744	56,769	536,823	9.2
81–82.	0.052599	55,397	2,914	53,940	480,054	8.7
82–83.	0.058586	52,483	3,075	50,946	426,114	8.1
83–84.	0.065124	49,408	3,218	47,800	375,168	7.6
84–85.	0.073400	46,191	3,390	44,496	327,369	7.1
85–86.	0.081636	42,800	3,494	41,053	282,873	6.6
86–87.	0.089815	39,306	3,530	37,541	241,820	6.2
87–88.	0.100898	35,776	3,610	33,971	204,279	5.7
88–89.	0.113081	32,166	3,637	30,348	170,308	5.3
89–90.	0.126406	28,529	3,606	26,726	139,960	4.9
90–91.	0.140901	24,923	3,512	23,167	113,234	4.5
91–92.	0.156577	21,411	3,352	19,735	90,067	4.2
92–93.	0.173422	18,059	3,132	16,493	70,333	3.9
93–94.	0.191399	14,927	2,857	13,498	53,840	3.6
94–95.	0.210444	12,070	2,540	10,800	40,342	3.3
95–96.	0.230465	9,530	2,196	8,432	29,542	3.1
96–97.	0.251342	7,334	1,843	6,412	21,110	2.9
97–98.	0.272927	5,490	1,498	4,741	14,698	2.7
98–99.	0.295049	3,992	1,178	3,403	9,957	2.5
99–100.	0.317517	2,814	894	2,367	6,554	2.3
100 and over	1.000000	1,921	1,921	4,187	4,187	2.2

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 2. Life table for males: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table02.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1.	0.006213	100,000	621	99,456	7,622,240	76.2
1–2.	0.000411	99,379	41	99,358	7,522,784	75.7
2–3.	0.000301	99,338	30	99,323	7,423,426	74.7
3–4.	0.000223	99,308	22	99,297	7,324,103	73.8
4–5.	0.000170	99,286	17	99,277	7,224,806	72.8
5–6.	0.000160	99,269	16	99,261	7,125,529	71.8
6–7.	0.000141	99,253	14	99,246	7,026,268	70.8
7–8.	0.000124	99,239	12	99,233	6,927,022	69.8
8–9.	0.000108	99,227	11	99,221	6,827,789	68.8
9–10.	0.000092	99,216	9	99,211	6,728,568	67.8
10–11	0.000085	99,207	8	99,203	6,629,356	66.8
11–12	0.000095	99,199	9	99,194	6,530,154	65.8
12–13	0.000135	99,189	13	99,182	6,430,960	64.8
13–14	0.000210	99,176	21	99,165	6,331,777	63.8
14–15	0.000315	99,155	31	99,139	6,232,612	62.9
15–16	0.000432	99,124	43	99,102	6,133,473	61.9
16–17	0.000551	99,081	55	99,053	6,034,371	60.9
17–18.	0.000679	99,026	67	98,993	5,935,317	59.9
18–19.	0.000811	98,959	80	98,919	5,836,325	59.0
19–20.	0.000945	98,879	93	98,832	5,737,406	58.0
20–21	0.001082	98,785	107	98,732	5,638,574	57.1
21–22.	0.001214	98,678	120	98,618	5,539,842	56.1
22–23.	0.001327	98,559	131	98,493	5,441,224	55.2
23–24.	0.001413	98,428	139	98,358	5,342,730	54.3
24–25.	0.001476	98,289	145	98,216	5,244,372	53.4
25–26.	0.001531	98,144	150	98,068	5,146,156	52.4
26–27.	0.001584	97,993	155	97,916	5,048,088	51.5
27–28.	0.001633	97,838	160	97,758	4,950,172	50.6
28–29.	0.001681	97,678	164	97,596	4,852,414	49.7
29–30.	0.001730	97,514	169	97,430	4,754,818	48.8
30–31.	0.001779	97,345	173	97,259	4,657,388	47.8
31–32.	0.001829	97,172	178	97,083	4,560,129	46.9
32–33.	0.001888	96,994	183	96,903	4,463,046	46.0
33–34.	0.001957	96,811	189	96,717	4,366,143	45.1
34–35.	0.002032	96,622	196	96,524	4,269,426	44.2
35–36.	0.002119	96,425	204	96,323	4,172,903	43.3
36–37.	0.002209	96,221	213	96,115	4,076,580	42.4
37–38.	0.002286	96,009	219	95,899	3,980,465	41.5
38–39.	0.002346	95,789	225	95,677	3,884,566	40.6
39–40.	0.002401	95,564	229	95,450	3,788,889	39.6
40–41.	0.002468	95,335	235	95,217	3,693,440	38.7
41–42.	0.002565	95,100	244	94,978	3,598,223	37.8
42–43.	0.002700	94,856	256	94,728	3,503,245	36.9
43–44.	0.002876	94,600	272	94,464	3,408,517	36.0
44–45.	0.003084	94,327	291	94,182	3,314,054	35.1
45–46.	0.003318	94,037	312	93,881	3,219,872	34.2
46–47.	0.003572	93,725	335	93,557	3,125,991	33.4
47–48.	0.003850	93,390	360	93,210	3,032,434	32.5
48–49.	0.004161	93,030	387	92,837	2,939,224	31.6
49–50.	0.004515	92,643	418	92,434	2,846,387	30.7
50–51.	0.004895	92,225	451	91,999	2,753,953	29.9
51–52.	0.005321	91,773	488	91,529	2,661,954	29.0
52–53.	0.005835	91,285	533	91,019	2,570,425	28.2
53–54.	0.006438	90,752	584	90,460	2,479,406	27.3
54–55.	0.007098	90,168	640	89,848	2,388,946	26.5
55–56.	0.007765	89,528	695	89,181	2,299,098	25.7
56–57.	0.008432	88,833	749	88,458	2,209,917	24.9
57–58.	0.009126	88,084	804	87,682	2,121,458	24.1
58–59.	0.009870	87,280	861	86,849	2,033,776	23.3
59–60.	0.010670	86,419	922	85,958	1,946,927	22.5

Table 2. Life table for males: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table02.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61.	0.011534	85,497	986	85,004	1,860,969	21.8
61–62.	0.012431	84,511	1,051	83,985	1,775,966	21.0
62–63.	0.013332	83,460	1,113	82,904	1,691,981	20.3
63–64.	0.014219	82,347	1,171	81,762	1,609,077	19.5
64–65.	0.015117	81,176	1,227	80,563	1,527,315	18.8
65–66.	0.016078	79,949	1,285	79,306	1,446,752	18.1
66–67.	0.017216	78,664	1,354	77,987	1,367,446	17.4
67–68.	0.018401	77,310	1,423	76,598	1,289,459	16.7
68–69.	0.019666	75,887	1,492	75,141	1,212,861	16.0
69–70.	0.021099	74,395	1,570	73,610	1,137,720	15.3
70–71.	0.022544	72,825	1,642	72,004	1,064,111	14.6
71–72.	0.024099	71,183	1,715	70,325	992,107	13.9
72–73.	0.026447	69,468	1,837	68,549	921,781	13.3
73–74.	0.028617	67,630	1,935	66,663	853,232	12.6
74–75.	0.031390	65,695	2,062	64,664	786,569	12.0
75–76.	0.034322	63,633	2,184	62,541	721,905	11.3
76–77.	0.037970	61,449	2,333	60,282	659,364	10.7
77–78.	0.041944	59,116	2,480	57,876	599,082	10.1
78–79.	0.045881	56,636	2,599	55,337	541,206	9.6
79–80.	0.050573	54,038	2,733	52,671	485,869	9.0
80–81.	0.055675	51,305	2,856	49,877	433,198	8.4
81–82.	0.061704	48,448	2,989	46,954	383,321	7.9
82–83.	0.068389	45,459	3,109	43,905	336,368	7.4
83–84.	0.075732	42,350	3,207	40,746	292,463	6.9
84–85.	0.085241	39,143	3,337	37,475	251,717	6.4
85–86.	0.094489	35,806	3,383	34,115	214,242	6.0
86–87.	0.104787	32,423	3,397	30,724	180,128	5.6
87–88.	0.117465	29,025	3,409	27,321	149,403	5.1
88–89.	0.131319	25,616	3,364	23,934	122,083	4.8
89–90.	0.146372	22,252	3,257	20,624	98,149	4.4
90–91.	0.162625	18,995	3,089	17,451	77,525	4.1
91–92.	0.180060	15,906	2,864	14,474	60,075	3.8
92–93.	0.198626	13,042	2,590	11,747	45,601	3.5
93–94.	0.218248	10,451	2,281	9,311	33,854	3.2
94–95.	0.238820	8,170	1,951	7,195	24,543	3.0
95–96.	0.260206	6,219	1,618	5,410	17,348	2.8
96–97.	0.282243	4,601	1,299	3,952	11,938	2.6
97–98.	0.304747	3,302	1,006	2,799	7,986	2.4
98–99.	0.327517	2,296	752	1,920	5,187	2.3
99–100.	0.350342	1,544	541	1,274	3,267	2.1
100 and over	1.000000	1,003	1,003	1,994	1,994	2.0

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 3. Life table for females: United States, 2018

Spreadsheet version available from: *https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table03.xlsx*.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1.	0.005061	100,000	506	99,557	8,124,665	81.2
1–2.	0.000320	99,494	32	99,478	8,025,108	80.7
2–3.	0.000224	99,462	22	99,451	7,925,630	79.7
3–4.	0.000150	99,440	15	99,432	7,826,179	78.7
4–5.	0.000125	99,425	12	99,419	7,726,747	77.7
5–6.	0.000123	99,412	12	99,406	7,627,328	76.7
6–7.	0.000111	99,400	11	99,395	7,527,922	75.7
7–8.	0.000102	99,389	10	99,384	7,428,527	74.7
8–9.	0.000097	99,379	10	99,374	7,329,143	73.7
9–10.	0.000096	99,369	9	99,365	7,229,769	72.8
10–11	0.000098	99,360	10	99,355	7,130,404	71.8
11–12	0.000106	99,350	10	99,345	7,031,049	70.8
12–13	0.000121	99,340	12	99,334	6,931,704	69.8
13–14	0.000146	99,328	14	99,320	6,832,370	68.8
14–15	0.000177	99,313	18	99,304	6,733,050	67.8
15–16	0.000214	99,296	21	99,285	6,633,746	66.8
16–17	0.000253	99,274	25	99,262	6,534,461	65.8
17–18.	0.000292	99,249	29	99,235	6,435,199	64.8
18–19.	0.000329	99,220	33	99,204	6,335,964	63.9
19–20.	0.000365	99,188	36	99,170	6,236,760	62.9
20–21	0.000402	99,151	40	99,132	6,137,591	61.9
21–22.	0.000441	99,112	44	99,090	6,038,459	60.9
22–23.	0.000481	99,068	48	99,044	5,939,369	60.0
23–24.	0.000521	99,020	52	98,994	5,840,325	59.0
24–25.	0.000560	98,969	55	98,941	5,741,331	58.0
25–26.	0.000598	98,913	59	98,884	5,642,390	57.0
26–27.	0.000635	98,854	63	98,823	5,543,506	56.1
27–28.	0.000675	98,791	67	98,758	5,444,683	55.1
28–29.	0.000718	98,725	71	98,689	5,345,925	54.1
29–30.	0.000765	98,654	76	98,616	5,247,236	53.2
30–31.	0.000818	98,578	81	98,538	5,148,620	52.2
31–32.	0.000872	98,498	86	98,455	5,050,082	51.3
32–33.	0.000928	98,412	91	98,366	4,951,627	50.3
33–34.	0.000983	98,321	97	98,272	4,853,261	49.4
34–35.	0.001037	98,224	102	98,173	4,754,988	48.4
35–36.	0.001097	98,122	108	98,068	4,656,816	47.5
36–37.	0.001160	98,014	114	97,957	4,558,747	46.5
37–38.	0.001219	97,901	119	97,841	4,460,790	45.6
38–39.	0.001274	97,781	125	97,719	4,362,949	44.6
39–40.	0.001330	97,657	130	97,592	4,265,230	43.7
40–41.	0.001396	97,527	136	97,459	4,167,638	42.7
41–42.	0.001480	97,391	144	97,319	4,070,180	41.8
42–43.	0.001584	97,247	154	97,170	3,972,861	40.9
43–44.	0.001709	97,093	166	97,010	3,875,691	39.9
44–45.	0.001849	96,927	179	96,837	3,778,682	39.0
45–46.	0.002002	96,747	194	96,650	3,681,845	38.1
46–47.	0.002167	96,554	209	96,449	3,585,194	37.1
47–48.	0.002348	96,344	226	96,231	3,488,745	36.2
48–49.	0.002551	96,118	245	95,996	3,392,514	35.3
49–50.	0.002781	95,873	267	95,740	3,296,519	34.4
50–51.	0.003028	95,606	289	95,462	3,200,779	33.5
51–52.	0.003299	95,317	314	95,160	3,105,317	32.6
52–53.	0.003615	95,002	343	94,831	3,010,158	31.7
53–54.	0.003974	94,659	376	94,471	2,915,327	30.8
54–55.	0.004357	94,283	411	94,077	2,820,856	29.9
55–56.	0.004746	93,872	446	93,649	2,726,779	29.0
56–57.	0.005135	93,426	480	93,187	2,633,129	28.2
57–58.	0.005530	92,947	514	92,690	2,539,943	27.3
58–59.	0.005940	92,433	549	92,158	2,447,253	26.5
59–60.	0.006376	91,884	586	91,591	2,355,095	25.6

Table 3. Life table for females: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table03.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61.	0.006849	91,298	625	90,985	2,263,504	24.8
61–62.	0.007354	90,672	667	90,339	2,172,519	24.0
62–63.	0.007879	90,006	709	89,651	2,082,180	23.1
63–64.	0.008425	89,296	752	88,920	1,992,529	22.3
64–65.	0.009008	88,544	798	88,145	1,903,609	21.5
65–66.	0.009638	87,747	846	87,324	1,815,464	20.7
66–67.	0.010386	86,901	903	86,450	1,728,140	19.9
67–68.	0.011235	85,998	966	85,515	1,641,690	19.1
68–69.	0.012237	85,032	1,041	84,512	1,556,175	18.3
69–70.	0.013393	83,992	1,125	83,429	1,471,663	17.5
70–71.	0.014731	82,867	1,221	82,256	1,388,234	16.8
71–72.	0.016080	81,646	1,313	80,990	1,305,978	16.0
72–73.	0.017952	80,333	1,442	79,612	1,224,989	15.2
73–74.	0.019637	78,891	1,549	78,116	1,145,377	14.5
74–75.	0.021744	77,342	1,682	76,501	1,067,260	13.8
75–76.	0.023929	75,660	1,810	74,755	990,759	13.1
76–77.	0.026629	73,850	1,967	72,866	916,004	12.4
77–78.	0.029547	71,883	2,124	70,821	843,138	11.7
78–79.	0.032857	69,759	2,292	68,613	772,317	11.1
79–80.	0.036519	67,467	2,464	66,235	703,704	10.4
80–81.	0.040589	65,003	2,638	63,684	637,469	9.8
81–82.	0.045639	62,365	2,846	60,942	573,785	9.2
82–83.	0.051261	59,518	3,051	57,993	512,844	8.6
83–84.	0.057423	56,468	3,243	54,846	454,851	8.1
84–85.	0.065035	53,225	3,461	51,494	400,004	7.5
85–86.	0.072862	49,763	3,626	47,951	348,510	7.0
86–87.	0.080121	46,138	3,697	44,289	300,559	6.5
87–88.	0.090650	42,441	3,847	40,517	256,270	6.0
88–89.	0.102322	38,594	3,949	36,619	215,753	5.6
89–90.	0.115196	34,645	3,991	32,649	179,133	5.2
90–91.	0.129319	30,654	3,964	28,672	146,484	4.8
91–92.	0.144719	26,690	3,863	24,758	117,812	4.4
92–93.	0.161402	22,827	3,684	20,985	93,054	4.1
93–94.	0.179347	19,143	3,433	17,426	72,069	3.8
94–95.	0.198504	15,710	3,118	14,150	54,643	3.5
95–96.	0.218788	12,591	2,755	11,214	40,492	3.2
96–97.	0.240082	9,836	2,362	8,656	29,278	3.0
97–98.	0.262235	7,475	1,960	6,495	20,623	2.8
98–99.	0.285066	5,515	1,572	4,729	14,128	2.6
99–100.	0.308369	3,943	1,216	3,335	9,399	2.4
100 and over	1.000000	2,727	2,727	6,064	6,064	2.2

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 4. Life table for the Hispanic population: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table04.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1	0.004848	100,000	485	99,572	8,182,860	81.8
1–2	0.000283	99,515	28	99,501	8,083,287	81.2
2–3	0.000209	99,487	21	99,477	7,983,786	80.2
3–4	0.000158	99,466	16	99,458	7,884,310	79.3
4–5	0.000108	99,451	11	99,445	7,784,851	78.3
5–6	0.000107	99,440	11	99,435	7,685,406	77.3
6–7	0.000093	99,429	9	99,425	7,585,971	76.3
7–8	0.000084	99,420	8	99,416	7,486,547	75.3
8–9	0.000077	99,412	8	99,408	7,387,131	74.3
9–10	0.000074	99,404	7	99,400	7,287,723	73.3
10–11	0.000075	99,397	7	99,393	7,188,323	72.3
11–12	0.000085	99,389	8	99,385	7,088,930	71.3
12–13	0.000109	99,381	11	99,375	6,989,545	70.3
13–14	0.000148	99,370	15	99,363	6,890,170	69.3
14–15	0.000201	99,355	20	99,345	6,790,807	68.3
15–16	0.000260	99,335	26	99,322	6,691,462	67.4
16–17	0.000324	99,309	32	99,293	6,592,140	66.4
17–18	0.000393	99,277	39	99,258	6,492,846	65.4
18–19	0.000466	99,238	46	99,215	6,393,589	64.4
19–20	0.000540	99,192	54	99,165	6,294,374	63.5
20–21	0.000617	99,138	61	99,108	6,195,208	62.5
21–22	0.000692	99,077	69	99,043	6,096,100	61.5
22–23	0.000756	99,009	75	98,971	5,997,057	60.6
23–24	0.000802	98,934	79	98,894	5,898,086	59.6
24–25	0.000835	98,855	82	98,813	5,799,192	58.7
25–26	0.000863	98,772	85	98,729	5,700,379	57.7
26–27	0.000891	98,687	88	98,643	5,601,649	56.8
27–28	0.000911	98,599	90	98,554	5,503,006	55.8
28–29	0.000926	98,509	91	98,463	5,404,453	54.9
29–30	0.000936	98,418	92	98,372	5,305,989	53.9
30–31	0.000943	98,326	93	98,279	5,207,617	53.0
31–32	0.000952	98,233	94	98,186	5,109,338	52.0
32–33	0.000974	98,139	96	98,092	5,011,152	51.1
33–34	0.001011	98,044	99	97,994	4,913,060	50.1
34–35	0.001061	97,945	104	97,893	4,815,066	49.2
35–36	0.001119	97,841	109	97,786	4,717,174	48.2
36–37	0.001176	97,731	115	97,674	4,619,388	47.3
37–38	0.001226	97,616	120	97,557	4,521,714	46.3
38–39	0.001265	97,497	123	97,435	4,424,157	45.4
39–40	0.001302	97,373	127	97,310	4,326,722	44.4
40–41	0.001341	97,247	130	97,181	4,229,412	43.5
41–42	0.001396	97,116	136	97,048	4,132,231	42.5
42–43	0.001474	96,981	143	96,909	4,035,182	41.6
43–44	0.001582	96,838	153	96,761	3,938,273	40.7
44–45	0.001717	96,685	166	96,601	3,841,512	39.7
45–46	0.001867	96,518	180	96,428	3,744,911	38.8
46–47	0.002029	96,338	195	96,240	3,648,482	37.9
47–48	0.002211	96,143	213	96,036	3,552,242	36.9
48–49	0.002416	95,930	232	95,814	3,456,205	36.0
49–50	0.002645	95,698	253	95,572	3,360,391	35.1
50–51	0.002896	95,445	276	95,307	3,264,819	34.2
51–52	0.003169	95,169	302	95,018	3,169,512	33.3
52–53	0.003470	94,867	329	94,703	3,074,494	32.4
53–54	0.003797	94,538	359	94,359	2,979,792	31.5
54–55	0.004149	94,179	391	93,984	2,885,433	30.6
55–56	0.004523	93,788	424	93,576	2,791,449	29.8
56–57	0.004919	93,364	459	93,135	2,697,873	28.9
57–58	0.005342	92,905	496	92,657	2,604,738	28.0
58–59	0.005797	92,409	536	92,141	2,512,082	27.2
59–60	0.006287	91,873	578	91,584	2,419,941	26.3

See footnotes at end of table.

Table 4. Life table for the Hispanic population: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table04.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61.	0.006830	91,295	624	90,984	2,328,357	25.5
61–62.	0.007410	90,672	672	90,336	2,237,373	24.7
62–63.	0.007992	90,000	719	89,640	2,147,037	23.9
63–64.	0.008551	89,281	763	88,899	2,057,397	23.0
64–65.	0.009107	88,517	806	88,114	1,968,498	22.2
65–66.	0.009692	87,711	850	87,286	1,880,384	21.4
66–67.	0.010357	86,861	900	86,411	1,793,098	20.6
67–68.	0.011129	85,961	957	85,483	1,706,687	19.9
68–69.	0.012039	85,005	1,023	84,493	1,621,204	19.1
69–70.	0.013082	83,981	1,099	83,432	1,536,710	18.3
70–71.	0.014252	82,883	1,181	82,292	1,453,278	17.5
71–72.	0.015526	81,702	1,268	81,067	1,370,986	16.8
72–73.	0.016900	80,433	1,359	79,753	1,289,919	16.0
73–74.	0.018379	79,074	1,453	78,347	1,210,165	15.3
74–75.	0.020013	77,620	1,553	76,844	1,131,818	14.6
75–76.	0.021830	76,067	1,661	75,237	1,054,975	13.9
76–77.	0.023999	74,406	1,786	73,514	979,738	13.2
77–78.	0.026630	72,621	1,934	71,654	906,224	12.5
78–79.	0.029579	70,687	2,091	69,642	834,570	11.8
79–80.	0.032915	68,596	2,258	67,467	764,929	11.2
80–81.	0.036527	66,338	2,423	65,127	697,462	10.5
81–82.	0.040881	63,915	2,613	62,609	632,335	9.9
82–83.	0.045601	61,302	2,795	59,904	569,726	9.3
83–84.	0.050862	58,507	2,976	57,019	509,822	8.7
84–85.	0.057667	55,531	3,202	53,930	452,803	8.2
85–86.	0.064427	52,329	3,371	50,643	398,873	7.6
86–87.	0.070772	48,957	3,465	47,225	348,230	7.1
87–88.	0.079939	45,493	3,637	43,674	301,005	6.6
88–89.	0.090092	41,856	3,771	39,970	257,331	6.1
89–90.	0.101287	38,085	3,858	36,156	217,360	5.7
90–91.	0.113566	34,228	3,887	32,284	181,204	5.3
91–92.	0.126958	30,340	3,852	28,414	148,920	4.9
92–93.	0.141477	26,488	3,748	24,615	120,506	4.5
93–94.	0.157112	22,741	3,573	20,955	95,891	4.2
94–95.	0.173829	19,168	3,332	17,502	74,936	3.9
95–96.	0.191566	15,836	3,034	14,319	57,434	3.6
96–97.	0.210235	12,802	2,692	11,457	43,115	3.4
97–98.	0.229718	10,111	2,323	8,950	31,658	3.1
98–99.	0.249870	7,788	1,946	6,815	22,709	2.9
99–100.	0.270524	5,842	1,580	5,052	15,893	2.7
100 and over	1.000000	4,262	4,262	10,841	10,841	2.5

NOTES: This life table is based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 5. Life table for Hispanic males: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table05.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1.	0.005324	100,000	532	99,529	7,907,514	79.1
1–2.	0.000296	99,468	29	99,453	7,807,985	78.5
2–3.	0.000244	99,438	24	99,426	7,708,532	77.5
3–4.	0.000178	99,414	18	99,405	7,609,106	76.5
4–5.	0.000112	99,396	11	99,391	7,509,701	75.6
5–6.	0.000114	99,385	11	99,379	7,410,310	74.6
6–7.	0.000097	99,374	10	99,369	7,310,931	73.6
7–8.	0.000084	99,364	8	99,360	7,211,562	72.6
8–9.	0.000073	99,356	7	99,352	7,112,202	71.6
9–10.	0.000067	99,348	7	99,345	7,012,850	70.6
10–11	0.000066	99,342	7	99,339	6,913,505	69.6
11–12	0.000078	99,335	8	99,331	6,814,166	68.6
12–13	0.000110	99,327	11	99,322	6,714,835	67.6
13–14	0.000165	99,317	16	99,308	6,615,513	66.6
14–15	0.000241	99,300	24	99,288	6,516,204	65.6
15–16	0.000326	99,276	32	99,260	6,416,916	64.6
16–17	0.000417	99,244	41	99,223	6,317,656	63.7
17–18	0.000521	99,203	52	99,177	6,218,433	62.7
18–19	0.000637	99,151	63	99,119	6,119,256	61.7
19–20	0.000759	99,088	75	99,050	6,020,137	60.8
20–21	0.000885	99,013	88	98,969	5,921,087	59.8
21–22	0.001006	98,925	100	98,875	5,822,118	58.9
22–23	0.001108	98,825	109	98,771	5,723,243	57.9
23–24	0.001180	98,716	117	98,658	5,624,472	57.0
24–25	0.001229	98,599	121	98,539	5,525,814	56.0
25–26	0.001272	98,478	125	98,416	5,427,275	55.1
26–27	0.001312	98,353	129	98,289	5,328,860	54.2
27–28	0.001336	98,224	131	98,158	5,230,571	53.3
28–29	0.001342	98,093	132	98,027	5,132,413	52.3
29–30	0.001337	97,961	131	97,896	5,034,386	51.4
30–31	0.001322	97,830	129	97,766	4,936,490	50.5
31–32	0.001312	97,701	128	97,637	4,838,725	49.5
32–33	0.001326	97,573	129	97,508	4,741,088	48.6
33–34	0.001374	97,443	134	97,376	4,643,580	47.7
34–35	0.001449	97,309	141	97,239	4,546,204	46.7
35–36	0.001536	97,168	149	97,094	4,448,965	45.8
36–37	0.001618	97,019	157	96,941	4,351,871	44.9
37–38	0.001690	96,862	164	96,780	4,254,930	43.9
38–39	0.001745	96,698	169	96,614	4,158,150	43.0
39–40	0.001792	96,530	173	96,443	4,061,536	42.1
40–41	0.001843	96,357	178	96,268	3,965,092	41.2
41–42	0.001913	96,179	184	96,087	3,868,825	40.2
42–43	0.002008	95,995	193	95,899	3,772,737	39.3
43–44	0.002134	95,802	204	95,700	3,676,839	38.4
44–45	0.002288	95,598	219	95,489	3,581,138	37.5
45–46	0.002460	95,379	235	95,262	3,485,650	36.5
46–47	0.002649	95,145	252	95,019	3,390,388	35.6
47–48	0.002864	94,893	272	94,757	3,295,369	34.7
48–49	0.003110	94,621	294	94,474	3,200,613	33.8
49–50	0.003390	94,327	320	94,167	3,106,139	32.9
50–51	0.003693	94,007	347	93,833	3,011,972	32.0
51–52	0.004024	93,660	377	93,471	2,918,139	31.2
52–53	0.004401	93,283	411	93,077	2,824,668	30.3
53–54	0.004832	92,872	449	92,648	2,731,591	29.4
54–55	0.005311	92,423	491	92,178	2,638,943	28.6
55–56	0.005830	91,932	536	91,664	2,546,765	27.7
56–57	0.006378	91,396	583	91,105	2,455,101	26.9
57–58	0.006955	90,814	632	90,498	2,363,996	26.0
58–59	0.007561	90,182	682	89,841	2,273,498	25.2
59–60	0.008204	89,500	734	89,133	2,183,657	24.4

See footnotes at end of table.

Table 5. Life table for Hispanic males: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table05.xlsx.

Age (years)	Probability of dying between ages x and $x + 1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x + 1$ d_x	Person-years lived between ages x and $x + 1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61.	0.008917	88,766	792	88,370	2,094,524	23.6
61–62.	0.009686	87,974	852	87,548	2,006,154	22.8
62–63.	0.010458	87,122	911	86,667	1,918,606	22.0
63–64.	0.011200	86,211	966	85,728	1,831,939	21.2
64–65.	0.011928	85,246	1,017	84,737	1,746,211	20.5
65–66.	0.012687	84,229	1,069	83,694	1,661,474	19.7
66–67.	0.013542	83,160	1,126	82,597	1,577,779	19.0
67–68.	0.014523	82,034	1,191	81,438	1,495,182	18.2
68–69.	0.015672	80,843	1,267	80,209	1,413,744	17.5
69–70.	0.016979	79,576	1,351	78,900	1,333,535	16.8
70–71.	0.018437	78,224	1,442	77,503	1,254,635	16.0
71–72.	0.020005	76,782	1,536	76,014	1,177,132	15.3
72–73.	0.021660	75,246	1,630	74,431	1,101,117	14.6
73–74.	0.023394	73,616	1,722	72,755	1,026,686	13.9
74–75.	0.025269	71,894	1,817	70,986	953,931	13.3
75–76.	0.027324	70,077	1,915	69,120	882,945	12.6
76–77.	0.029788	68,163	2,030	67,147	813,825	11.9
77–78.	0.032897	66,132	2,176	65,044	746,677	11.3
78–79.	0.036371	63,957	2,326	62,794	681,633	10.7
79–80.	0.040439	61,631	2,492	60,384	618,839	10.0
80–81.	0.044811	59,138	2,650	57,813	558,455	9.4
81–82.	0.050022	56,488	2,826	55,075	500,641	8.9
82–83.	0.055628	53,663	2,985	52,170	445,566	8.3
83–84.	0.061726	50,677	3,128	49,113	393,396	7.8
84–85.	0.069986	47,549	3,328	45,885	344,283	7.2
85–86.	0.077853	44,222	3,443	42,500	298,397	6.7
86–87.	0.085975	40,779	3,506	39,026	255,897	6.3
87–88.	0.097045	37,273	3,617	35,464	216,871	5.8
88–89.	0.109246	33,656	3,677	31,817	181,407	5.4
89–90.	0.122619	29,979	3,676	28,141	149,590	5.0
90–91.	0.137186	26,303	3,608	24,499	121,449	4.6
91–92.	0.152948	22,695	3,471	20,959	96,950	4.3
92–93.	0.169880	19,223	3,266	17,591	75,991	4.0
93–94.	0.187927	15,958	2,999	14,458	58,401	3.7
94–95.	0.207005	12,959	2,683	11,618	43,942	3.4
95–96.	0.226996	10,276	2,333	9,110	32,325	3.1
96–97.	0.247753	7,944	1,968	6,960	23,215	2.9
97–98.	0.269102	5,976	1,608	5,172	16,255	2.7
98–99.	0.290846	4,368	1,270	3,732	11,083	2.5
99–100.	0.312774	3,097	969	2,613	7,351	2.4
100 and over	1.000000	2,129	2,129	4,738	4,738	2.2

NOTES: This life table is based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 6. Life table for Hispanic females: United States, 2018

Spreadsheet version available from: *https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table06.xlsx*.

Age (years)	Probability of dying between ages x and $x + 1$	Number surviving to age x	Number dying between ages x and $x + 1$	Person-years lived between ages x and $x + 1$	Total number of person-years lived above age x	Expectation of life at age x
	q_x	l_x	d_x	L_x	T_x	e_x
0–1.	0.004840	100,000	484	99,574	8,431,803	84.3
1–2.	0.000264	99,516	26	99,503	8,332,229	83.7
2–3.	0.000167	99,490	17	99,481	8,232,726	82.7
3–4.	0.000135	99,473	13	99,466	8,133,244	81.8
4–5.	0.000101	99,460	10	99,455	8,033,778	80.8
5–6.	0.000096	99,450	10	99,445	7,934,323	79.8
6–7.	0.000088	99,440	9	99,436	7,834,879	78.8
7–8.	0.000083	99,431	8	99,427	7,735,443	77.8
8–9.	0.000080	99,423	8	99,419	7,636,016	76.8
9–10.	0.000079	99,415	8	99,411	7,536,597	75.8
10–11	0.000082	99,407	8	99,403	7,437,186	74.8
11–12	0.000089	99,399	9	99,395	7,337,783	73.8
12–13	0.000104	99,390	10	99,385	7,238,388	72.8
13–14	0.000128	99,380	13	99,373	7,139,003	71.8
14–15	0.000159	99,367	16	99,359	7,039,629	70.8
15–16	0.000195	99,351	19	99,342	6,940,270	69.9
16–17	0.000231	99,332	23	99,321	6,840,928	68.9
17–18.	0.000264	99,309	26	99,296	6,741,608	67.9
18–19.	0.000290	99,283	29	99,268	6,642,312	66.9
19–20.	0.000310	99,254	31	99,239	6,543,044	65.9
20–21	0.000329	99,223	33	99,207	6,443,805	64.9
21–22.	0.000351	99,191	35	99,173	6,344,598	64.0
22–23.	0.000370	99,156	37	99,138	6,245,424	63.0
23–24.	0.000388	99,119	38	99,100	6,146,287	62.0
24–25.	0.000404	99,081	40	99,061	6,047,187	61.0
25–26.	0.000419	99,041	42	99,020	5,948,126	60.1
26–27.	0.000434	98,999	43	98,978	5,849,106	59.1
27–28.	0.000452	98,956	45	98,934	5,750,129	58.1
28–29.	0.000472	98,912	47	98,888	5,651,195	57.1
29–30.	0.000496	98,865	49	98,840	5,552,307	56.2
30–31.	0.000522	98,816	52	98,790	5,453,466	55.2
31–32.	0.000550	98,764	54	98,737	5,354,676	54.2
32–33.	0.000579	98,710	57	98,681	5,255,939	53.2
33–34.	0.000608	98,653	60	98,623	5,157,258	52.3
34–35.	0.000636	98,593	63	98,561	5,058,635	51.3
35–36.	0.000668	98,530	66	98,497	4,960,074	50.3
36–37.	0.000703	98,464	69	98,430	4,861,577	49.4
37–38.	0.000734	98,395	72	98,359	4,763,147	48.4
38–39.	0.000763	98,323	75	98,285	4,664,788	47.4
39–40.	0.000791	98,248	78	98,209	4,566,503	46.5
40–41.	0.000822	98,170	81	98,130	4,468,294	45.5
41–42.	0.000864	98,089	85	98,047	4,370,164	44.6
42–43.	0.000927	98,005	91	97,959	4,272,117	43.6
43–44.	0.001018	97,914	100	97,864	4,174,158	42.6
44–45.	0.001132	97,814	111	97,759	4,076,294	41.7
45–46.	0.001258	97,703	123	97,642	3,978,536	40.7
46–47.	0.001391	97,580	136	97,512	3,880,894	39.8
47–48.	0.001538	97,445	150	97,370	3,783,382	38.8
48–49.	0.001700	97,295	165	97,212	3,686,012	37.9
49–50.	0.001878	97,129	182	97,038	3,588,800	36.9
50–51.	0.002076	96,947	201	96,846	3,491,762	36.0
51–52.	0.002289	96,746	221	96,635	3,394,916	35.1
52–53.	0.002513	96,524	243	96,403	3,298,281	34.2
53–54.	0.002741	96,282	264	96,150	3,201,878	33.3
54–55.	0.002975	96,018	286	95,875	3,105,728	32.3
55–56.	0.003218	95,732	308	95,578	3,009,853	31.4
56–57.	0.003479	95,424	332	95,258	2,914,275	30.5
57–58.	0.003768	95,092	358	94,913	2,819,017	29.6
58–59.	0.004093	94,734	388	94,540	2,724,105	28.8
59–60.	0.004456	94,346	420	94,136	2,629,565	27.9

See footnotes at end of table.

Table 6. Life table for Hispanic females: United States, 2018—Con.

Spreadsheet version available from: *https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table06.xlsx.*

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61	0.004860	93,926	457	93,697	2,535,429	27.0
61–62	0.005291	93,469	495	93,222	2,441,731	26.1
62–63	0.005728	92,975	533	92,708	2,348,510	25.3
63–64	0.006157	92,442	569	92,157	2,255,801	24.4
64–65	0.006594	91,873	606	91,570	2,163,644	23.6
65–66	0.007068	91,267	645	90,945	2,072,074	22.7
66–67	0.007613	90,622	690	90,277	1,981,129	21.9
67–68	0.008247	89,932	742	89,561	1,890,852	21.0
68–69	0.008991	89,190	802	88,789	1,801,291	20.2
69–70	0.009845	88,389	870	87,953	1,712,501	19.4
70–71	0.010806	87,518	946	87,046	1,624,548	18.6
71–72	0.011873	86,573	1,028	86,059	1,537,503	17.8
72–73	0.013063	85,545	1,117	84,986	1,451,444	17.0
73–74	0.014395	84,427	1,215	83,820	1,366,458	16.2
74–75	0.015907	83,212	1,324	82,550	1,282,638	15.4
75–76	0.017619	81,888	1,443	81,167	1,200,088	14.7
76–77	0.019637	80,446	1,580	79,656	1,118,921	13.9
77–78	0.021995	78,866	1,735	77,999	1,039,265	13.2
78–79	0.024664	77,131	1,902	76,180	961,267	12.5
79–80	0.027593	75,229	2,076	74,191	885,087	11.8
80–81	0.030848	73,153	2,257	72,025	810,896	11.1
81–82	0.034871	70,896	2,472	69,660	738,871	10.4
82–83	0.039259	68,424	2,686	67,081	669,211	9.8
83–84	0.044315	65,738	2,913	64,281	602,130	9.2
84–85	0.050572	62,825	3,177	61,236	537,849	8.6
85–86	0.057118	59,648	3,407	57,944	476,613	8.0
86–87	0.062800	56,241	3,532	54,475	418,669	7.4
87–88	0.071634	52,709	3,776	50,821	364,194	6.9
88–89	0.081526	48,933	3,989	46,938	313,373	6.4
89–90	0.092549	44,944	4,159	42,864	266,435	5.9
90–91	0.104769	40,784	4,273	38,648	223,571	5.5
91–92	0.118235	36,511	4,317	34,353	184,923	5.1
92–93	0.132981	32,194	4,281	30,054	150,571	4.7
93–94	0.149014	27,913	4,159	25,833	120,517	4.3
94–95	0.166315	23,754	3,951	21,778	94,684	4.0
95–96	0.184831	19,803	3,660	17,973	72,905	3.7
96–97	0.204475	16,143	3,301	14,492	54,932	3.4
97–98	0.225123	12,842	2,891	11,396	40,440	3.1
98–99	0.246617	9,951	2,454	8,724	29,043	2.9
99–100	0.268766	7,497	2,015	6,489	20,320	2.7
100 and over	1.000000	5,482	5,482	13,830	13,830	2.5

NOTES: This life table is based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 7. Life table for the non-Hispanic white population: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table07.xlsx.

Age (years)	Probability of dying between ages x and $x+1$	Number surviving to age x	Number dying between ages x and $x+1$	Person-years lived between ages x and $x+1$	Total number of person-years lived above age x	Expectation of life at age x
	q_x	l_x	d_x	L_x	T_x	e_x
0–1.........................	0.004620	100,000	462	99,597	7,863,060	78.6
1–2.........................	0.000331	99,538	33	99,522	7,763,464	78.0
2–3.........................	0.000249	99,505	25	99,493	7,663,942	77.0
3–4.........................	0.000174	99,480	17	99,472	7,564,449	76.0
4–5.........................	0.000142	99,463	14	99,456	7,464,978	75.1
5–6.........................	0.000129	99,449	13	99,442	7,365,522	74.1
6–7.........................	0.000113	99,436	11	99,430	7,266,080	73.1
7–8.........................	0.000101	99,425	10	99,420	7,166,649	72.1
8–9.........................	0.000091	99,415	9	99,410	7,067,230	71.1
9–10........................	0.000084	99,406	8	99,401	6,967,820	70.1
10–11	0.000083	99,397	8	99,393	6,868,418	69.1
11–12	0.000094	99,389	9	99,384	6,769,025	68.1
12–13	0.000122	99,380	12	99,374	6,669,641	67.1
13–14	0.000172	99,368	17	99,359	6,570,267	66.1
14–15	0.000239	99,350	24	99,339	6,470,908	65.1
15–16	0.000313	99,327	31	99,311	6,371,570	64.1
16–17	0.000389	99,296	39	99,276	6,272,259	63.2
17–18	0.000469	99,257	47	99,234	6,172,982	62.2
18–19	0.000551	99,210	55	99,183	6,073,749	61.2
19–20	0.000634	99,156	63	99,124	5,974,566	60.3
20–21	0.000720	99,093	71	99,057	5,875,442	59.3
21–22	0.000807	99,021	80	98,981	5,776,385	58.3
22–23	0.000889	98,941	88	98,898	5,677,403	57.4
23–24	0.000964	98,854	95	98,806	5,578,506	56.4
24–25	0.001031	98,758	102	98,707	5,479,700	55.5
25–26	0.001094	98,656	108	98,602	5,380,992	54.5
26–27	0.001156	98,548	114	98,491	5,282,390	53.6
27–28	0.001217	98,435	120	98,375	5,183,899	52.7
28–29	0.001279	98,315	126	98,252	5,085,524	51.7
29–30	0.001345	98,189	132	98,123	4,987,272	50.8
30–31	0.001413	98,057	139	97,988	4,889,149	49.9
31–32	0.001482	97,918	145	97,846	4,791,162	48.9
32–33	0.001551	97,773	152	97,697	4,693,316	48.0
33–34	0.001617	97,622	158	97,543	4,595,618	47.1
34–35	0.001681	97,464	164	97,382	4,498,076	46.2
35–36	0.001753	97,300	171	97,215	4,400,694	45.2
36–37	0.001828	97,129	178	97,041	4,303,479	44.3
37–38	0.001893	96,952	184	96,860	4,206,439	43.4
38–39	0.001945	96,768	188	96,674	4,109,579	42.5
39–40	0.001994	96,580	193	96,484	4,012,904	41.6
40–41	0.002055	96,387	198	96,288	3,916,421	40.6
41–42	0.002143	96,189	206	96,086	3,820,132	39.7
42–43	0.002264	95,983	217	95,875	3,724,046	38.8
43–44	0.002417	95,766	232	95,650	3,628,171	37.9
44–45	0.002594	95,535	248	95,411	3,532,521	37.0
45–46	0.002790	95,287	266	95,154	3,437,110	36.1
46–47	0.003002	95,021	285	94,878	3,341,957	35.2
47–48	0.003229	94,736	306	94,583	3,247,078	34.3
48–49	0.003479	94,430	328	94,265	3,152,496	33.4
49–50	0.003761	94,101	354	93,924	3,058,230	32.5
50–51	0.004061	93,747	381	93,557	2,964,306	31.6
51–52	0.004398	93,366	411	93,161	2,870,750	30.7
52–53	0.004808	92,956	447	92,732	2,777,588	29.9
53–54	0.005289	92,509	489	92,264	2,684,856	29.0
54–55	0.005808	92,020	534	91,752	2,592,592	28.2
55–56	0.006327	91,485	579	91,196	2,500,839	27.3
56–57	0.006835	90,906	621	90,596	2,409,644	26.5
57–58	0.007353	90,285	664	89,953	2,319,048	25.7
58–59	0.007897	89,621	708	89,267	2,229,095	24.9
59–60	0.008477	88,913	754	88,537	2,139,828	24.1

See footnotes at end of table.

Table 7. Life table for the non-Hispanic white population: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table07.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61	0.009108	88,160	803	87,758	2,051,291	23.3
61–62	0.009769	87,357	853	86,930	1,963,533	22.5
62–63	0.010439	86,503	903	86,052	1,876,603	21.7
63–64	0.011109	85,600	951	85,125	1,790,551	20.9
64–65	0.011802	84,649	999	84,150	1,705,426	20.1
65–66	0.012544	83,650	1,049	83,126	1,621,276	19.4
66–67	0.013439	82,601	1,110	82,046	1,538,151	18.6
67–68	0.014438	81,491	1,177	80,903	1,456,105	17.9
68–69	0.015607	80,314	1,253	79,688	1,375,202	17.1
69–70	0.016962	79,061	1,341	78,390	1,295,514	16.4
70–71	0.018433	77,720	1,433	77,004	1,217,124	15.7
71–72	0.019910	76,287	1,519	75,528	1,140,120	14.9
72–73	0.022070	74,768	1,650	73,943	1,064,593	14.2
73–74	0.023989	73,118	1,754	72,241	990,649	13.5
74–75	0.026462	71,364	1,888	70,420	918,408	12.9
75–76	0.028995	69,476	2,014	68,469	847,988	12.2
76–77	0.032211	67,461	2,173	66,375	779,520	11.6
77–78	0.035719	65,288	2,332	64,122	713,145	10.9
78–79	0.039273	62,956	2,472	61,720	649,022	10.3
79–80	0.043424	60,484	2,626	59,171	587,302	9.7
80–81	0.047976	57,857	2,776	56,470	528,132	9.1
81–82	0.053476	55,082	2,946	53,609	471,662	8.6
82–83	0.059503	52,136	3,102	50,585	418,053	8.0
83–84	0.066192	49,034	3,246	47,411	367,468	7.5
84–85	0.074804	45,788	3,425	44,076	320,057	7.0
85–86	0.083314	42,363	3,529	40,598	275,982	6.5
86–87	0.091262	38,834	3,544	37,062	235,383	6.1
87–88	0.102679	35,290	3,623	33,478	198,322	5.6
88–89	0.115238	31,666	3,649	29,842	164,844	5.2
89–90	0.128982	28,017	3,614	26,210	135,002	4.8
90–91	0.143938	24,403	3,513	22,647	108,792	4.5
91–92	0.160112	20,891	3,345	19,218	86,145	4.1
92–93	0.177485	17,546	3,114	15,989	66,927	3.8
93–94	0.196015	14,432	2,829	13,017	50,938	3.5
94–95	0.215626	11,603	2,502	10,352	37,920	3.3
95–96	0.236214	9,101	2,150	8,026	27,569	3.0
96–97	0.257646	6,951	1,791	6,056	19,542	2.8
97–98	0.279758	5,160	1,444	4,438	13,487	2.6
98–99	0.302365	3,717	1,124	3,155	9,048	2.4
99–100	0.325263	2,593	843	2,171	5,893	2.3
100 and over	1.000000	1,750	1,750	3,722	3,722	2.1

NOTES: This life table is based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 8. Life table for non-Hispanic white males: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table08.xlsx.

Age (years)	Probability of dying between ages x and x + 1 q_x	Number surviving to age x l_x	Number dying between ages x and x + 1 d_x	Person-years lived between ages x and x + 1 L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1.	0.005076	100,000	508	99,558	7,619,829	76.2
1–2.	0.000407	99,492	40	99,472	7,520,271	75.6
2–3.	0.000301	99,452	30	99,437	7,420,799	74.6
3–4.	0.000221	99,422	22	99,411	7,321,362	73.6
4–5.	0.000180	99,400	18	99,391	7,221,951	72.7
5–6.	0.000157	99,382	16	99,374	7,122,560	71.7
6–7.	0.000135	99,367	13	99,360	7,023,185	70.7
7–8.	0.000119	99,353	12	99,347	6,923,825	69.7
8–9.	0.000106	99,341	11	99,336	6,824,478	68.7
9–10.	0.000098	99,331	10	99,326	6,725,142	67.7
10–11	0.000098	99,321	10	99,316	6,625,816	66.7
11–12	0.000114	99,311	11	99,306	6,526,500	65.7
12–13	0.000153	99,300	15	99,292	6,427,195	64.7
13–14	0.000221	99,285	22	99,274	6,327,902	63.7
14–15	0.000311	99,263	31	99,247	6,228,628	62.7
15–16	0.000411	99,232	41	99,212	6,129,381	61.8
16–17	0.000514	99,191	51	99,166	6,030,169	60.8
17–18.	0.000627	99,140	62	99,109	5,931,004	59.8
18–19.	0.000747	99,078	74	99,041	5,831,894	58.9
19–20.	0.000873	99,004	86	98,961	5,732,853	57.9
20–21	0.001002	98,918	99	98,868	5,633,893	57.0
21–22.	0.001130	98,819	112	98,763	5,535,024	56.0
22–23.	0.001248	98,707	123	98,645	5,436,262	55.1
23–24.	0.001352	98,584	133	98,517	5,337,616	54.1
24–25.	0.001441	98,450	142	98,379	5,239,099	53.2
25–26.	0.001525	98,309	150	98,234	5,140,720	52.3
26–27.	0.001605	98,159	158	98,080	5,042,486	51.4
27–28.	0.001680	98,001	165	97,919	4,944,406	50.5
28–29.	0.001753	97,836	172	97,751	4,846,488	49.5
29–30.	0.001827	97,665	178	97,576	4,748,737	48.6
30–31.	0.001901	97,486	185	97,394	4,651,162	47.7
31–32.	0.001975	97,301	192	97,205	4,553,768	46.8
32–33.	0.002051	97,109	199	97,009	4,456,563	45.9
33–34.	0.002127	96,910	206	96,807	4,359,553	45.0
34–35.	0.002201	96,704	213	96,597	4,262,747	44.1
35–36.	0.002286	96,491	221	96,381	4,166,149	43.2
36–37.	0.002373	96,270	228	96,156	4,069,769	42.3
37–38.	0.002444	96,042	235	95,924	3,973,613	41.4
38–39.	0.002496	95,807	239	95,688	3,877,688	40.5
39–40.	0.002541	95,568	243	95,447	3,782,001	39.6
40–41.	0.002598	95,325	248	95,201	3,686,554	38.7
41–42.	0.002689	95,077	256	94,950	3,591,353	37.8
42–43.	0.002820	94,822	267	94,688	3,496,403	36.9
43–44.	0.002995	94,554	283	94,413	3,401,715	36.0
44–45.	0.003201	94,271	302	94,120	3,307,302	35.1
45–46.	0.003433	93,969	323	93,808	3,213,182	34.2
46–47.	0.003686	93,647	345	93,474	3,119,374	33.3
47–48.	0.003959	93,302	369	93,117	3,025,900	32.4
48–49.	0.004259	92,932	396	92,734	2,932,783	31.6
49–50.	0.004602	92,536	426	92,324	2,840,049	30.7
50–51.	0.004967	92,111	458	91,882	2,747,725	29.8
51–52.	0.005381	91,653	493	91,406	2,655,843	29.0
52–53.	0.005893	91,160	537	90,891	2,564,437	28.1
53–54.	0.006504	90,623	589	90,328	2,473,545	27.3
54–55.	0.007169	90,033	645	89,711	2,383,218	26.5
55–56.	0.007832	89,388	700	89,038	2,293,507	25.7
56–57.	0.008482	88,688	752	88,312	2,204,469	24.9
57–58.	0.009151	87,936	805	87,533	2,116,158	24.1
58–59.	0.009863	87,131	859	86,701	2,028,624	23.3
59–60.	0.010626	86,271	917	85,813	1,941,923	22.5

See footnotes at end of table.

Table 8. Life table for non-Hispanic white males: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table08.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61.	0.011452	85,355	977	84,866	1,856,110	21.7
61–62.	0.012308	84,377	1,039	83,858	1,771,244	21.0
62–63.	0.013163	83,339	1,097	82,790	1,687,386	20.2
63–64.	0.013999	82,242	1,151	81,666	1,604,596	19.5
64–65.	0.014846	81,091	1,204	80,489	1,522,930	18.8
65–66.	0.015747	79,887	1,258	79,258	1,442,441	18.1
66–67.	0.016844	78,629	1,324	77,967	1,363,183	17.3
67–68.	0.018017	77,304	1,393	76,608	1,285,217	16.6
68–69.	0.019337	75,911	1,468	75,178	1,208,609	15.9
69–70.	0.020871	74,444	1,554	73,667	1,133,431	15.2
70–71.	0.022427	72,890	1,635	72,072	1,059,765	14.5
71–72.	0.024018	71,255	1,711	70,399	987,692	13.9
72–73.	0.026452	69,544	1,840	68,624	917,293	13.2
73–74.	0.028594	67,704	1,936	66,736	848,669	12.5
74–75.	0.031490	65,768	2,071	64,733	781,933	11.9
75–76.	0.034416	63,697	2,192	62,601	717,200	11.3
76–77.	0.038177	61,505	2,348	60,331	654,599	10.6
77–78.	0.042325	59,157	2,504	57,905	594,268	10.0
78–79.	0.046248	56,653	2,620	55,343	536,363	9.5
79–80.	0.051102	54,033	2,761	52,652	481,020	8.9
80–81.	0.056288	51,272	2,886	49,829	428,367	8.4
81–82.	0.062478	48,386	3,023	46,874	378,538	7.8
82–83.	0.069313	45,363	3,144	43,791	331,664	7.3
83–84.	0.076720	42,219	3,239	40,599	287,873	6.8
84–85.	0.086706	38,980	3,380	37,290	247,274	6.3
85–86.	0.096170	35,600	3,424	33,888	209,985	5.9
86–87.	0.105892	32,176	3,407	30,473	176,097	5.5
87–88.	0.119068	28,769	3,425	27,056	145,624	5.1
88–89.	0.133492	25,344	3,383	23,652	118,568	4.7
89–90.	0.149188	21,960	3,276	20,322	94,916	4.3
90–91.	0.166155	18,684	3,104	17,132	74,594	4.0
91–92.	0.184363	15,580	2,872	14,144	57,462	3.7
92–93.	0.203755	12,707	2,589	11,413	43,318	3.4
93–94.	0.224238	10,118	2,269	8,984	31,906	3.2
94–95.	0.245687	7,849	1,928	6,885	22,922	2.9
95–96.	0.267946	5,921	1,586	5,128	16,037	2.7
96–97.	0.290828	4,334	1,261	3,704	10,909	2.5
97–98.	0.314124	3,074	966	2,591	7,205	2.3
98–99.	0.337610	2,108	712	1,752	4,614	2.2
99–100.	0.361054	1,396	504	1,144	2,862	2.0
100 and over	1.000000	892	892	1,717	1,717	1.9

NOTES: This life table is based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 9. Life table for non-Hispanic white females: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table09.xlsx.

Age (years)	Probability of dying between ages x and x + 1 q_x	Number surviving to age x l_x	Number dying between ages x and x + 1 d_x	Person-years lived between ages x and x + 1 L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1.	0.004140	100,000	414	99,637	8,109,660	81.1
1–2.	0.000252	99,586	25	99,574	8,010,023	80.4
2–3.	0.000195	99,561	19	99,551	7,910,449	79.5
3–4.	0.000126	99,542	13	99,535	7,810,898	78.5
4–5.	0.000104	99,529	10	99,524	7,711,363	77.5
5–6.	0.000100	99,519	10	99,514	7,611,839	76.5
6–7.	0.000089	99,509	9	99,504	7,512,325	75.5
7–8.	0.000081	99,500	8	99,496	7,412,821	74.5
8–9.	0.000074	99,492	7	99,488	7,313,325	73.5
9–10.	0.000069	99,484	7	99,481	7,213,837	72.5
10–11	0.000068	99,478	7	99,474	7,114,356	71.5
11–12	0.000074	99,471	7	99,467	7,014,882	70.5
12–13	0.000091	99,464	9	99,459	6,915,414	69.5
13–14	0.000122	99,454	12	99,448	6,815,955	68.5
14–15	0.000163	99,442	16	99,434	6,716,507	67.5
15–16	0.000210	99,426	21	99,416	6,617,073	66.6
16–17	0.000258	99,405	26	99,392	6,517,657	65.6
17–18.	0.000303	99,380	30	99,364	6,418,265	64.6
18–19.	0.000344	99,349	34	99,332	6,318,900	63.6
19–20.	0.000382	99,315	38	99,296	6,219,568	62.6
20–21	0.000422	99,277	42	99,256	6,120,272	61.6
21–22.	0.000465	99,235	46	99,212	6,021,016	60.7
22–23.	0.000509	99,189	51	99,164	5,921,803	59.7
23–24.	0.000555	99,139	55	99,111	5,822,639	58.7
24–25.	0.000599	99,084	59	99,054	5,723,528	57.8
25–26.	0.000643	99,024	64	98,993	5,624,474	56.8
26–27.	0.000686	98,961	68	98,927	5,525,481	55.8
27–28.	0.000733	98,893	72	98,857	5,426,555	54.9
28–29.	0.000786	98,820	78	98,781	5,327,698	53.9
29–30.	0.000846	98,743	84	98,701	5,228,917	53.0
30–31.	0.000910	98,659	90	98,614	5,130,216	52.0
31–32.	0.000975	98,569	96	98,521	5,031,602	51.0
32–33.	0.001039	98,473	102	98,422	4,933,080	50.1
33–34.	0.001097	98,371	108	98,317	4,834,658	49.1
34–35.	0.001150	98,263	113	98,207	4,736,341	48.2
35–36.	0.001210	98,150	119	98,091	4,638,135	47.3
36–37.	0.001275	98,031	125	97,969	4,540,044	46.3
37–38.	0.001334	97,906	131	97,841	4,442,076	45.4
38–39.	0.001386	97,776	136	97,708	4,344,235	44.4
39–40.	0.001439	97,640	141	97,570	4,246,527	43.5
40–41.	0.001504	97,500	147	97,426	4,148,957	42.6
41–42.	0.001590	97,353	155	97,276	4,051,531	41.6
42–43.	0.001700	97,198	165	97,116	3,954,255	40.7
43–44.	0.001833	97,033	178	96,944	3,857,140	39.8
44–45.	0.001981	96,855	192	96,759	3,760,196	38.8
45–46.	0.002142	96,663	207	96,560	3,663,437	37.9
46–47.	0.002314	96,456	223	96,345	3,566,877	37.0
47–48.	0.002497	96,233	240	96,113	3,470,533	36.1
48–49.	0.002697	95,993	259	95,863	3,374,420	35.2
49–50.	0.002922	95,734	280	95,594	3,278,557	34.2
50–51.	0.003159	95,454	302	95,303	3,182,963	33.3
51–52.	0.003422	95,153	326	94,990	3,087,659	32.4
52–53.	0.003734	94,827	354	94,650	2,992,670	31.6
53–54.	0.004092	94,473	387	94,279	2,898,020	30.7
54–55.	0.004473	94,086	421	93,876	2,803,740	29.8
55–56.	0.004857	93,665	455	93,438	2,709,865	28.9
56–57.	0.005234	93,210	488	92,966	2,616,427	28.1
57–58.	0.005612	92,723	520	92,462	2,523,460	27.2
58–59.	0.006002	92,202	553	91,925	2,430,998	26.4
59–60.	0.006416	91,649	588	91,355	2,339,073	25.5

See footnotes at end of table.

Table 9. Life table for non-Hispanic white females: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table09.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61	0.006871	91,061	626	90,748	2,247,718	24.7
61–62	0.007359	90,435	666	90,102	2,156,970	23.9
62–63	0.007867	89,769	706	89,416	2,066,868	23.0
63–64	0.008393	89,063	748	88,690	1,977,451	22.2
64–65	0.008958	88,316	791	87,920	1,888,762	21.4
65–66	0.009568	87,525	837	87,106	1,800,842	20.6
66–67	0.010302	86,687	893	86,241	1,713,736	19.8
67–68	0.011165	85,794	958	85,315	1,627,495	19.0
68–69	0.012216	84,836	1,036	84,318	1,542,180	18.2
69–70	0.013432	83,800	1,126	83,237	1,457,862	17.4
70–71	0.014833	82,674	1,226	82,061	1,374,625	16.6
71–72	0.016219	81,448	1,321	80,788	1,292,563	15.9
72–73	0.018152	80,127	1,454	79,400	1,211,776	15.1
73–74	0.019904	78,673	1,566	77,890	1,132,376	14.4
74–75	0.022051	77,107	1,700	76,257	1,054,486	13.7
75–76	0.024299	75,406	1,832	74,490	978,230	13.0
76–77	0.027123	73,574	1,996	72,576	903,739	12.3
77–78	0.030175	71,579	2,160	70,499	831,163	11.6
78–79	0.033527	69,419	2,327	68,255	760,664	11.0
79–80	0.037195	67,091	2,495	65,844	692,409	10.3
80–81	0.041367	64,596	2,672	63,260	626,566	9.7
81–82	0.046474	61,924	2,878	60,485	563,306	9.1
82–83	0.052049	59,046	3,073	57,509	502,821	8.5
83–84	0.058430	55,973	3,270	54,337	445,312	8.0
84–85	0.066267	52,702	3,492	50,956	390,975	7.4
85–86	0.074403	49,210	3,661	47,379	340,019	6.9
86–87	0.081415	45,548	3,708	43,694	292,640	6.4
87–88	0.092232	41,840	3,859	39,911	248,945	5.9
88–89	0.104231	37,981	3,959	36,002	209,035	5.5
89–90	0.117470	34,022	3,997	32,024	173,033	5.1
90–91	0.131997	30,026	3,963	28,044	141,009	4.7
91–92	0.147837	26,062	3,853	24,136	112,965	4.3
92–93	0.164991	22,209	3,664	20,377	88,830	4.0
93–94	0.183431	18,545	3,402	16,844	68,452	3.7
94–95	0.203099	15,143	3,076	13,605	51,608	3.4
95–96	0.223898	12,068	2,702	10,717	38,003	3.1
96–97	0.245698	9,366	2,301	8,215	27,286	2.9
97–98	0.268334	7,065	1,896	6,117	19,071	2.7
98–99	0.291611	5,169	1,507	4,415	12,954	2.5
99–100	0.315309	3,662	1,155	3,084	8,539	2.3
100 and over	1.000000	2,507	2,507	5,454	5,454	2.2

NOTES: This life table is based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 10. Life table for the non-Hispanic black population: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table10.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1............................	0.010727	100,000	1,073	99,062	7,471,471	74.7
1–2............................	0.000683	98,927	68	98,894	7,372,409	74.5
2–3............................	0.000489	98,860	48	98,836	7,273,515	73.6
3–4............................	0.000322	98,811	32	98,795	7,174,680	72.6
4–5............................	0.000270	98,780	27	98,766	7,075,884	71.6
5–6............................	0.000269	98,753	27	98,740	6,977,118	70.7
6–7............................	0.000245	98,726	24	98,714	6,878,378	69.7
7–8............................	0.000222	98,702	22	98,691	6,779,664	68.7
8–9............................	0.000196	98,680	19	98,671	6,680,973	67.7
9–10............................	0.000171	98,661	17	98,652	6,582,302	66.7
10–11	0.000153	98,644	15	98,636	6,483,650	65.7
11–12	0.000158	98,629	16	98,621	6,385,014	64.7
12–13	0.000200	98,613	20	98,604	6,286,392	63.7
13–14	0.000289	98,594	29	98,579	6,187,789	62.8
14–15	0.000414	98,565	41	98,545	6,089,210	61.8
15–16	0.000553	98,524	54	98,497	5,990,665	60.8
16–17	0.000691	98,470	68	98,436	5,892,168	59.8
17–18	0.000833	98,402	82	98,361	5,793,732	58.9
18–19	0.000973	98,320	96	98,272	5,695,371	57.9
19–20	0.001109	98,224	109	98,170	5,597,099	57.0
20–21	0.001247	98,115	122	98,054	5,498,929	56.0
21–22	0.001380	97,993	135	97,925	5,400,875	55.1
22–23	0.001485	97,858	145	97,785	5,302,950	54.2
23–24	0.001551	97,712	152	97,637	5,205,165	53.3
24–25	0.001588	97,561	155	97,483	5,107,528	52.4
25–26	0.001616	97,406	157	97,327	5,010,045	51.4
26–27	0.001647	97,249	160	97,169	4,912,717	50.5
27–28	0.001684	97,088	163	97,007	4,815,549	49.6
28–29	0.001735	96,925	168	96,841	4,718,542	48.7
29–30	0.001802	96,757	174	96,670	4,621,701	47.8
30–31	0.001880	96,582	182	96,492	4,525,031	46.9
31–32	0.001966	96,401	190	96,306	4,428,540	45.9
32–33	0.002066	96,211	199	96,112	4,332,234	45.0
33–34	0.002174	96,013	209	95,908	4,236,122	44.1
34–35	0.002284	95,804	219	95,694	4,140,214	43.2
35–36	0.002402	95,585	230	95,470	4,044,519	42.3
36–37	0.002530	95,355	241	95,235	3,949,049	41.4
37–38	0.002657	95,114	253	94,988	3,853,814	40.5
38–39	0.002786	94,861	264	94,729	3,758,826	39.6
39–40	0.002927	94,597	277	94,459	3,664,097	38.7
40–41	0.003093	94,320	292	94,174	3,569,638	37.8
41–42	0.003286	94,029	309	93,874	3,475,464	37.0
42–43	0.003494	93,720	327	93,556	3,381,590	36.1
43–44	0.003704	93,392	346	93,219	3,288,034	35.2
44–45	0.003919	93,046	365	92,864	3,194,815	34.3
45–46	0.004149	92,681	385	92,489	3,101,951	33.5
46–47	0.004410	92,297	407	92,093	3,009,462	32.6
47–48	0.004713	91,890	433	91,673	2,917,369	31.7
48–49	0.005074	91,457	464	91,225	2,825,695	30.9
49–50	0.005497	90,993	500	90,743	2,734,470	30.1
50–51	0.005950	90,493	538	90,223	2,643,728	29.2
51–52	0.006444	89,954	580	89,664	2,553,504	28.4
52–53	0.007025	89,375	628	89,061	2,463,840	27.6
53–54	0.007697	88,747	683	88,405	2,374,779	26.8
54–55	0.008432	88,064	743	87,692	2,286,374	26.0
55–56	0.009176	87,321	801	86,920	2,198,682	25.2
56–57	0.009930	86,520	859	86,090	2,111,761	24.4
57–58	0.010747	85,661	921	85,200	2,025,671	23.6
58–59	0.011657	84,740	988	84,246	1,940,471	22.9
59–60	0.012661	83,752	1,060	83,222	1,856,224	22.2

See footnotes at end of table.

Table 10. Life table for the non-Hispanic black population: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table10.xlsx.

Age (years)	Probability of dying between ages x and $x+1$	Number surviving to age x	Number dying between ages x and $x+1$	Person-years lived between ages x and $x+1$	Total number of person-years lived above age x	Expectation of life at age x
	q_x	l_x	d_x	L_x	T_x	e_x
60–61	0.013741	82,692	1,136	82,124	1,773,002	21.4
61–62	0.014852	81,556	1,211	80,950	1,690,878	20.7
62–63	0.015981	80,344	1,284	79,702	1,609,928	20.0
63–64	0.017111	79,060	1,353	78,384	1,530,226	19.4
64–65	0.018258	77,708	1,419	76,998	1,451,842	18.7
65–66	0.019516	76,289	1,489	75,544	1,374,844	18.0
66–67	0.020864	74,800	1,561	74,020	1,299,300	17.4
67–68	0.022187	73,239	1,625	72,427	1,225,280	16.7
68–69	0.023418	71,614	1,677	70,776	1,152,853	16.1
69–70	0.024633	69,937	1,723	69,076	1,082,077	15.5
70–71	0.026014	68,215	1,775	67,327	1,013,001	14.9
71–72	0.027525	66,440	1,829	65,526	945,674	14.2
72–73	0.029637	64,611	1,915	63,654	880,148	13.6
73–74	0.031692	62,696	1,987	61,703	816,495	13.0
74–75	0.034086	60,709	2,069	59,675	754,792	12.4
75–76	0.037025	58,640	2,171	57,554	695,117	11.9
76–77	0.040122	56,469	2,266	55,336	637,563	11.3
77–78	0.042998	54,203	2,331	53,038	582,226	10.7
78–79	0.046808	51,873	2,428	50,659	529,189	10.2
79–80	0.050521	49,445	2,498	48,196	478,530	9.7
80–81	0.054606	46,947	2,564	45,665	430,334	9.2
81–82	0.059973	44,383	2,662	43,052	384,670	8.7
82–83	0.066376	41,721	2,769	40,337	341,617	8.2
83–84	0.072017	38,952	2,805	37,549	301,281	7.7
84–85	0.077557	36,147	2,803	34,745	263,732	7.3
85–86	0.085424	33,343	2,848	31,919	228,987	6.9
86–87	0.093517	30,495	2,852	29,069	197,067	6.5
87–88	0.102242	27,643	2,826	26,230	167,998	6.1
88–89	0.111623	24,817	2,770	23,432	141,768	5.7
89–90	0.121679	22,047	2,683	20,705	118,336	5.4
90–91	0.132425	19,364	2,564	18,082	97,631	5.0
91–92	0.143869	16,800	2,417	15,591	79,549	4.7
92–93	0.156014	14,383	2,244	13,261	63,958	4.4
93–94	0.168852	12,139	2,050	11,114	50,697	4.2
94–95	0.182370	10,089	1,840	9,169	39,583	3.9
95–96	0.196542	8,249	1,621	7,439	30,414	3.7
96–97	0.211336	6,628	1,401	5,928	22,975	3.5
97–98	0.226706	5,227	1,185	4,635	17,047	3.3
98–99	0.242598	4,042	981	3,552	12,413	3.1
99–100	0.258948	3,062	793	2,665	8,861	2.9
100 and over	1.000000	2,269	2,269	6,196	6,196	2.7

NOTES: This life table is based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 11. Life table for non-Hispanic black males: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table11.xlsx.

Age (years)	Probability of dying between ages x and x + 1 q_x	Number surviving to age x l_x	Number dying between ages x and x + 1 d_x	Person-years lived between ages x and x + 1 L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1	0.011995	100,000	1,199	98,950	7,128,997	71.3
1–2	0.000702	98,801	69	98,766	7,030,047	71.2
2–3	0.000525	98,731	52	98,705	6,931,281	70.2
3–4	0.000358	98,679	35	98,662	6,832,576	69.2
4–5	0.000296	98,644	29	98,629	6,733,914	68.3
5–6	0.000286	98,615	28	98,601	6,635,285	67.3
6–7	0.000261	98,587	26	98,574	6,536,684	66.3
7–8	0.000233	98,561	23	98,549	6,438,110	65.3
8–9	0.000191	98,538	19	98,529	6,339,561	64.3
9–10	0.000141	98,519	14	98,512	6,241,032	63.3
10–11	0.000101	98,505	10	98,500	6,142,520	62.4
11–12	0.000098	98,495	10	98,490	6,044,020	61.4
12–13	0.000166	98,486	16	98,477	5,945,529	60.4
13–14	0.000324	98,469	32	98,453	5,847,052	59.4
14–15	0.000549	98,437	54	98,410	5,748,598	58.4
15–16	0.000796	98,383	78	98,344	5,650,188	57.4
16–17	0.001036	98,305	102	98,254	5,551,844	56.5
17–18	0.001274	98,203	125	98,141	5,453,590	55.5
18–19	0.001499	98,078	147	98,004	5,355,449	54.6
19–20	0.001706	97,931	167	97,847	5,257,445	53.7
20–21	0.001915	97,764	187	97,670	5,159,597	52.8
21–22	0.002114	97,577	206	97,474	5,061,927	51.9
22–23	0.002259	97,370	220	97,260	4,964,453	51.0
23–24	0.002334	97,150	227	97,037	4,867,193	50.1
24–25	0.002359	96,924	229	96,809	4,770,156	49.2
25–26	0.002365	96,695	229	96,581	4,673,347	48.3
26–27	0.002378	96,466	229	96,352	4,576,766	47.4
27–28	0.002404	96,237	231	96,121	4,480,414	46.6
28–29	0.002455	96,006	236	95,888	4,384,293	45.7
29–30	0.002531	95,770	242	95,649	4,288,405	44.8
30–31	0.002621	95,528	250	95,402	4,192,756	43.9
31–32	0.002717	95,277	259	95,148	4,097,354	43.0
32–33	0.002831	95,018	269	94,884	4,002,206	42.1
33–34	0.002956	94,749	280	94,609	3,907,322	41.2
34–35	0.003084	94,469	291	94,324	3,812,713	40.4
35–36	0.003224	94,178	304	94,026	3,718,390	39.5
36–37	0.003375	93,874	317	93,716	3,624,363	38.6
37–38	0.003525	93,557	330	93,393	3,530,648	37.7
38–39	0.003678	93,228	343	93,056	3,437,255	36.9
39–40	0.003843	92,885	357	92,706	3,344,199	36.0
40–41	0.004040	92,528	374	92,341	3,251,492	35.1
41–42	0.004270	92,154	393	91,957	3,159,152	34.3
42–43	0.004513	91,761	414	91,553	3,067,194	33.4
43–44	0.004755	91,346	434	91,129	2,975,641	32.6
44–45	0.005000	90,912	455	90,685	2,884,512	31.7
45–46	0.005262	90,457	476	90,220	2,793,827	30.9
46–47	0.005566	89,982	501	89,731	2,703,607	30.0
47–48	0.005927	89,481	530	89,216	2,613,876	29.2
48–49	0.006367	88,950	566	88,667	2,524,661	28.4
49–50	0.006889	88,384	609	88,080	2,435,993	27.6
50–51	0.007450	87,775	654	87,448	2,347,914	26.7
51–52	0.008062	87,121	702	86,770	2,260,466	25.9
52–53	0.008786	86,419	759	86,039	2,173,696	25.2
53–54	0.009630	85,660	825	85,247	2,087,656	24.4
54–55	0.010559	84,835	896	84,387	2,002,409	23.6
55–56	0.011504	83,939	966	83,456	1,918,022	22.9
56–57	0.012466	82,973	1,034	82,456	1,834,566	22.1
57–58	0.013520	81,939	1,108	81,385	1,752,110	21.4
58–59	0.014710	80,831	1,189	80,237	1,670,725	20.7
59–60	0.016039	79,642	1,277	79,003	1,590,488	20.0

See footnotes at end of table.

Table 11. Life table for non-Hispanic black males: United States, 2018—Con.

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table11.xlsx.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61	0.017471	78,365	1,369	77,680	1,511,485	19.3
61–62	0.018951	76,996	1,459	76,266	1,433,805	18.6
62–63	0.020484	75,537	1,547	74,763	1,357,539	18.0
63–64	0.022056	73,989	1,632	73,173	1,282,776	17.3
64–65	0.023682	72,357	1,714	71,501	1,209,603	16.7
65–66	0.025507	70,644	1,802	69,743	1,138,102	16.1
66–67	0.027435	68,842	1,889	67,898	1,068,359	15.5
67–68	0.029266	66,953	1,959	65,973	1,000,462	14.9
68–69	0.030803	64,994	2,002	63,993	934,488	14.4
69–70	0.032082	62,992	2,021	61,981	870,496	13.8
70–71	0.033425	60,971	2,038	59,952	808,514	13.3
71–72	0.035003	58,933	2,063	57,901	748,562	12.7
72–73	0.037203	56,870	2,116	55,812	690,661	12.1
73–74	0.040182	54,754	2,200	53,654	634,849	11.6
74–75	0.042821	52,554	2,250	51,429	581,194	11.1
75–76	0.046725	50,304	2,350	49,129	529,765	10.5
76–77	0.050461	47,953	2,420	46,743	480,637	10.0
77–78	0.054404	45,534	2,477	44,295	433,893	9.5
78–79	0.058845	43,056	2,534	41,790	389,598	9.0
79–80	0.063064	40,523	2,556	39,245	347,809	8.6
80–81	0.068031	37,967	2,583	36,676	308,564	8.1
81–82	0.073965	35,384	2,617	34,076	271,888	7.7
82–83	0.080399	32,767	2,634	31,450	237,813	7.3
83–84	0.088236	30,133	2,659	28,803	206,363	6.8
84–85	0.094411	27,474	2,594	26,177	177,560	6.5
85–86	0.102986	24,880	2,562	23,599	151,383	6.1
86–87	0.112188	22,318	2,504	21,066	127,784	5.7
87–88	0.122034	19,814	2,418	18,605	106,718	5.4
88–89	0.132537	17,396	2,306	16,243	88,113	5.1
89–90	0.143706	15,090	2,169	14,006	71,870	4.8
90–91	0.155542	12,922	2,010	11,917	57,864	4.5
91–92	0.168040	10,912	1,834	9,995	45,947	4.2
92–93	0.181185	9,078	1,645	8,256	35,952	4.0
93–94	0.194957	7,433	1,449	6,709	27,696	3.7
94–95	0.209325	5,984	1,253	5,358	20,987	3.5
95–96	0.224248	4,732	1,061	4,201	15,629	3.3
96–97	0.239677	3,671	880	3,231	11,428	3.1
97–98	0.255555	2,791	713	2,434	8,198	2.9
98–99	0.271815	2,078	565	1,795	5,764	2.8
99–100	0.288384	1,513	436	1,295	3,968	2.6
100 and over	1.000000	1,077	1,077	2,674	2,674	2.5

NOTES: This life table is based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 12. Life table for non-Hispanic black females: United States, 2018

Spreadsheet version available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table12.xlsx.

Age (years)	Probability of dying between ages x and x + 1	Number surviving to age x	Number dying between ages x and x + 1	Person-years lived between ages x and x + 1	Total number of person-years lived above age x	Expectation of life at age x
	q_x	l_x	d_x	L_x	T_x	e_x
0–1........................	0.009422	100,000	942	99,178	7,798,658	78.0
1–2........................	0.000580	99,058	57	99,029	7,699,480	77.7
2–3........................	0.000390	99,000	39	98,981	7,600,450	76.8
3–4........................	0.000244	98,962	24	98,950	7,501,469	75.8
4–5........................	0.000210	98,938	21	98,927	7,402,520	74.8
5–6........................	0.000221	98,917	22	98,906	7,303,593	73.8
6–7........................	0.000201	98,895	20	98,885	7,204,687	72.9
7–8........................	0.000186	98,875	18	98,866	7,105,802	71.9
8–9........................	0.000177	98,857	18	98,848	7,006,936	70.9
9–10........................	0.000174	98,839	17	98,831	6,908,088	69.9
10–11	0.000176	98,822	17	98,813	6,809,257	68.9
11–12	0.000185	98,805	18	98,795	6,710,444	67.9
12–13........................	0.000201	98,786	20	98,776	6,611,649	66.9
13–14	0.000225	98,766	22	98,755	6,512,872	65.9
14–15........................	0.000256	98,744	25	98,732	6,414,117	65.0
15–16........................	0.000292	98,719	29	98,705	6,315,385	64.0
16–17........................	0.000333	98,690	33	98,674	6,216,681	63.0
17–18........................	0.000381	98,657	38	98,639	6,118,007	62.0
18–19........................	0.000436	98,620	43	98,598	6,019,368	61.0
19–20........................	0.000496	98,577	49	98,552	5,920,770	60.1
20–21	0.000560	98,528	55	98,500	5,822,218	59.1
21–22........................	0.000624	98,473	61	98,442	5,723,717	58.1
22–23........................	0.000686	98,411	68	98,378	5,625,275	57.2
23–24........................	0.000743	98,344	73	98,307	5,526,898	56.2
24–25........................	0.000795	98,271	78	98,232	5,428,590	55.2
25–26........................	0.000845	98,193	83	98,151	5,330,359	54.3
26–27........................	0.000896	98,110	88	98,066	5,232,208	53.3
27–28........................	0.000947	98,022	93	97,975	5,134,142	52.4
28–29........................	0.001004	97,929	98	97,880	5,036,167	51.4
29–30........................	0.001071	97,831	105	97,778	4,938,287	50.5
30–31........................	0.001150	97,726	112	97,670	4,840,509	49.5
31–32........................	0.001238	97,613	121	97,553	4,742,839	48.6
32–33........................	0.001336	97,493	130	97,427	4,645,286	47.6
33–34........................	0.001436	97,362	140	97,292	4,547,859	46.7
34–35........................	0.001536	97,223	149	97,148	4,450,566	45.8
35–36........................	0.001641	97,073	159	96,994	4,353,418	44.8
36–37........................	0.001754	96,914	170	96,829	4,256,425	43.9
37–38........................	0.001865	96,744	180	96,654	4,159,596	43.0
38–39........................	0.001979	96,564	191	96,468	4,062,942	42.1
39–40........................	0.002102	96,372	203	96,271	3,966,474	41.2
40–41........................	0.002245	96,170	216	96,062	3,870,203	40.2
41–42........................	0.002409	95,954	231	95,838	3,774,141	39.3
42–43........................	0.002588	95,723	248	95,599	3,678,303	38.4
43–44........................	0.002773	95,475	265	95,343	3,582,704	37.5
44–45........................	0.002963	95,210	282	95,069	3,487,361	36.6
45–46........................	0.003165	94,928	300	94,778	3,392,292	35.7
46–47........................	0.003389	94,628	321	94,467	3,297,514	34.8
47–48........................	0.003641	94,307	343	94,135	3,203,046	34.0
48–49........................	0.003933	93,964	370	93,779	3,108,911	33.1
49–50........................	0.004269	93,594	400	93,394	3,015,132	32.2
50–51........................	0.004628	93,195	431	92,979	2,921,737	31.4
51–52........................	0.005018	92,763	466	92,531	2,828,759	30.5
52–53........................	0.005474	92,298	505	92,045	2,736,228	29.6
53–54........................	0.005997	91,793	550	91,517	2,644,183	28.8
54–55........................	0.006565	91,242	599	90,943	2,552,665	28.0
55–56........................	0.007138	90,643	647	90,320	2,461,723	27.2
56–57........................	0.007718	89,996	695	89,649	2,371,403	26.4
57–58........................	0.008339	89,302	745	88,929	2,281,754	25.6
58–59........................	0.009023	88,557	799	88,157	2,192,825	24.8
59–60........................	0.009772	87,758	858	87,329	2,104,668	24.0

See footnotes at end of table.

Table 12. Life table for non-Hispanic black females: United States, 2018—Con.

Age (years)	Probability of dying between ages x and $x+1$ q_x	Number surviving to age x l_x	Number dying between ages x and $x+1$ d_x	Person-years lived between ages x and $x+1$ L_x	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
60–61	0.010579	86,900	919	86,441	2,017,339	23.2
61–62	0.011409	85,981	981	85,490	1,930,898	22.5
62–63	0.012240	85,000	1,040	84,480	1,845,407	21.7
63–64	0.013055	83,960	1,096	83,412	1,760,928	21.0
64–65	0.013873	82,864	1,150	82,289	1,677,516	20.2
65–66	0.014752	81,714	1,205	81,111	1,595,227	19.5
66–67	0.015721	80,509	1,266	79,876	1,514,116	18.8
67–68	0.016723	79,243	1,325	78,580	1,434,241	18.1
68–69	0.017771	77,918	1,385	77,225	1,355,660	17.4
69–70	0.018982	76,533	1,453	75,807	1,278,435	16.7
70–71	0.020418	75,080	1,533	74,314	1,202,628	16.0
71–72	0.021918	73,547	1,612	72,741	1,128,315	15.3
72–73	0.024027	71,935	1,728	71,071	1,055,573	14.7
73–74	0.025480	70,207	1,789	69,312	984,502	14.0
74–75	0.027795	68,418	1,902	67,467	915,190	13.4
75–76	0.030169	66,516	2,007	65,513	847,723	12.7
76–77	0.032943	64,510	2,125	63,447	782,210	12.1
77–78	0.035305	62,384	2,202	61,283	718,763	11.5
78–79	0.038829	60,182	2,337	59,014	657,479	10.9
79–80	0.042354	57,845	2,450	56,620	598,466	10.3
80–81	0.046095	55,395	2,553	54,119	541,845	9.8
81–82	0.051296	52,842	2,711	51,486	487,727	9.2
82–83	0.057979	50,131	2,907	48,678	436,240	8.7
83–84	0.062654	47,225	2,959	45,745	387,563	8.2
84–85	0.068704	44,266	3,041	42,745	341,817	7.7
85–86	0.074764	41,225	3,082	39,684	299,072	7.3
86–87	0.083635	38,142	3,190	36,547	259,389	6.8
87–88	0.092281	34,952	3,225	33,340	222,841	6.4
88–89	0.101665	31,727	3,226	30,114	189,501	6.0
89–90	0.111818	28,501	3,187	26,908	159,387	5.6
90–91	0.122764	25,314	3,108	23,761	132,479	5.2
91–92	0.134522	22,207	2,987	20,713	108,719	4.9
92–93	0.147101	19,219	2,827	17,806	88,006	4.6
93–94	0.160502	16,392	2,631	15,077	70,200	4.3
94–95	0.174713	13,761	2,404	12,559	55,123	4.0
95–96	0.189711	11,357	2,155	10,280	42,564	3.7
96–97	0.205459	9,202	1,891	8,257	32,284	3.5
97–98	0.221906	7,312	1,623	6,500	24,027	3.3
98–99	0.238987	5,689	1,360	5,009	17,527	3.1
99–100	0.256624	4,330	1,111	3,774	12,517	2.9
100 and over	1.000000	3,218	3,218	8,743	8,743	2.7

NOTES: This life table is based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied; see Technical Notes.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Table 13. Estimated life expectancy at birth, in years, by race and Hispanic origin and sex: Death-registration states, 1900–1928, and United States, 1929–2018

[For selected years, life table values shown are estimates; see Technical Notes. Beginning in 1970, excludes death of nonresidents of the United States; see Technical Notes]

Area and year	All races and origins			Hispanic[1]			Non-Hispanic white			Non-Hispanic black[2]		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
United States[3]						Single race[4]						
2018[5]	78.7	76.2	81.2	81.8	79.1	84.3	78.6	76.2	81.1	74.7	71.3	78.0
						Bridged race[4]						
2018[5]	...	...	...	...	...	...	78.7	76.2	81.1	74.9	71.5	78.1
2017[5]	78.6	76.1	81.1	81.8	79.1	84.3	78.5	76.1	81.0	74.9	71.5	78.1
2016[5]	78.7	76.2	81.1	81.8	79.1	84.3	78.6	76.2	81.0	74.9	71.6	78.0
2015[5]	78.7	76.3	81.1	81.9	79.3	84.3	78.7	76.3	81.0	75.1	71.9	78.1
2014[5]	78.9	76.5	81.3	82.1	79.4	84.5	78.8	76.5	81.2	75.3	72.2	78.2
2013[5]	78.8	76.4	81.2	81.9	79.2	84.2	78.8	76.5	81.2	75.1	71.9	78.1
2012[5]	78.8	76.4	81.2	81.9	79.3	84.3	78.9	76.5	81.2	75.1	71.9	78.1
2011[5]	78.7	76.3	81.1	81.8	79.2	84.2	78.7	76.4	81.1	75.0	71.8	77.8
2010[5]	78.7	76.2	81.0	81.7	78.8	84.3	78.8	76.4	81.1	74.7	71.5	77.7
2009[5,6]	78.5	76.0	80.9	81.1	78.4	83.5	78.7	76.3	81.0	74.4	71.0	77.4
2008[5,6]	78.2	75.6	80.6	80.8	78.0	83.3	78.4	76.0	80.7	73.9	70.5	77.0
2007[5,6]	78.1	75.5	80.6	80.7	77.8	83.2	78.4	75.9	80.8	73.5	69.9	76.7
2006[5,6]	77.8	75.2	80.3	80.3	77.5	82.9	78.2	75.7	80.6	73.1	69.5	76.4
2005[5,6]	77.6	75.0	80.1	---	---	---	---	---	---	---	---	---
2004[5,6]	77.6	75.0	80.1	---	---	---	---	---	---	---	---	---
2003[5,6]	77.2	74.5	79.7	---	---	---	---	---	---	---	---	---
2002[5,6]	77.0	74.4	79.6	---	---	---	---	---	---	---	---	---
2001[5,6]	77.0	74.3	79.5	---	---	---	---	---	---	---	---	---
2000	76.8	74.1	79.3	---	---	---	---	---	---	---	---	---
1999	76.7	73.9	79.4	---	---	---	---	---	---	---	---	---
1998	76.7	73.8	79.5	---	---	---	---	---	---	---	---	---
1997	76.5	73.6	79.4	---	---	---	---	---	---	---	---	---
1996	76.1	73.1	79.1	---	---	---	---	---	---	---	---	---
1995	75.8	72.5	78.9	---	---	---	---	---	---	---	---	---
1994	75.7	72.4	79.0	---	---	---	---	---	---	---	---	---
1993	75.5	72.2	78.8	---	---	---	---	---	---	---	---	---
1992	75.8	72.3	79.1	---	---	---	---	---	---	---	---	---
1991	75.5	72.0	78.9	---	---	---	---	---	---	---	---	---
1990	75.4	71.8	78.8	---	---	---	---	---	---	---	---	---
1989	75.1	71.7	78.5	---	---	---	---	---	---	---	---	---
1988	74.9	71.4	78.3	---	---	---	---	---	---	---	---	---
1987	74.9	71.4	78.3	---	---	---	---	---	---	---	---	---
1986	74.7	71.2	78.2	---	---	---	---	---	---	---	---	---
1985	74.7	71.1	78.2	---	---	---	---	---	---	---	---	---
1984	74.7	71.1	78.2	---	---	---	---	---	---	---	---	---
1983	74.6	71.0	78.1	---	---	---	---	---	---	---	---	---
1982	74.5	70.8	78.1	---	---	---	---	---	---	---	---	---
1981	74.1	70.4	77.8	---	---	---	---	---	---	---	---	---
1980	73.7	70.0	77.4	---	---	---	---	---	---	---	---	---
1979	73.9	70.0	77.8	---	---	---	---	---	---	---	---	---
1978	73.5	69.6	77.3	---	---	---	---	---	---	---	---	---
1977	73.3	69.5	77.2	---	---	---	---	---	---	---	---	---
1976	72.9	69.1	76.8	---	---	---	---	---	---	---	---	---
1975	72.6	68.8	76.6	---	---	---	---	---	---	---	---	---
1974	72.0	68.2	75.9	---	---	---	---	---	---	---	---	---
1973	71.4	67.6	75.3	---	---	---	---	---	---	---	---	---
1972[7]	71.2	67.4	75.1	---	---	---	---	---	---	---	---	---
1971	71.1	67.4	75.0	---	---	---	---	---	---	---	---	---
1970	70.8	67.1	74.7	---	---	---	---	---	---	---	---	---
1969	70.5	66.8	74.4	---	---	---	---	---	---	---	---	---
1968	70.2	66.6	74.1	---	---	---	---	---	---	---	---	---
1967	70.5	67.0	74.3	---	---	---	---	---	---	---	---	---
1966	70.2	66.7	73.9	---	---	---	---	---	---	---	---	---
1965	70.2	66.8	73.8	---	---	---	---	---	---	---	---	---
1964	70.2	66.8	73.7	---	---	---	---	---	---	---	---	---

See footnotes at end of table.

Table 13. Estimated life expectancy at birth, in years, by race and Hispanic origin and sex: Death-registration states, 1900–1928, and United States, 1929–2018—Con.

[For selected years, life table values shown are estimates; see Technical Notes. Beginning in 1970, excludes death of nonresidents of the United States; see Technical Notes]

Area and year	All races and origins			Hispanic[1]			Non-Hispanic white			Non-Hispanic black[2]		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
United States[3]—Con.				Bridged race[4]—Con.								
1963[8]	69.9	66.6	73.4	---	---	---	---	---	---	---	---	---
1962[8]	70.1	66.9	73.5	---	---	---	---	---	---	---	---	---
1961	70.2	67.1	73.6	---	---	---	---	---	---	---	---	---
1960	69.7	66.6	73.1	---	---	---	---	---	---	---	---	---
1959	69.9	66.8	73.2	---	---	---	---	---	---	---	---	---
1958	69.6	66.6	72.9	---	---	---	---	---	---	---	---	---
1957	69.5	66.4	72.7	---	---	---	---	---	---	---	---	---
1956	69.7	66.7	72.9	---	---	---	---	---	---	---	---	---
1955	69.6	66.7	72.8	---	---	---	---	---	---	---	---	---
1954	69.6	66.7	72.8	---	---	---	---	---	---	---	---	---
1953	68.8	66.0	72.0	---	---	---	---	---	---	---	---	---
1952	68.6	65.8	71.6	---	---	---	---	---	---	---	---	---
1951	68.4	65.6	71.4	---	---	---	---	---	---	---	---	---
1950	68.2	65.6	71.1	---	---	---	---	---	---	---	---	---
1949	68.0	65.2	70.7	---	---	---	---	---	---	---	---	---
1948	67.2	64.6	69.9	---	---	---	---	---	---	---	---	---
1947	66.8	64.4	69.7	---	---	---	---	---	---	---	---	---
1946	66.7	64.4	69.4	---	---	---	---	---	---	---	---	---
1945	65.9	63.6	67.9	---	---	---	---	---	---	---	---	---
1944	65.2	63.6	66.8	---	---	---	---	---	---	---	---	---
1943	63.3	62.4	64.4	---	---	---	---	---	---	---	---	---
1942	66.2	64.7	67.9	---	---	---	---	---	---	---	---	---
1941	64.8	63.1	66.8	---	---	---	---	---	---	---	---	---
1940	62.9	60.8	65.2	---	---	---	---	---	---	---	---	---
1939	63.7	62.1	65.4	---	---	---	---	---	---	---	---	---
1938	63.5	61.9	65.3	---	---	---	---	---	---	---	---	---
1937	60.0	58.0	62.4	---	---	---	---	---	---	---	---	---
1936	58.5	56.6	60.6	---	---	---	---	---	---	---	---	---
1935	61.7	59.9	63.9	---	---	---	---	---	---	---	---	---
1934	61.1	59.3	63.3	---	---	---	---	---	---	---	---	---
1933	63.3	61.7	65.1	---	---	---	---	---	---	---	---	---
1932	62.1	61.0	63.5	---	---	---	---	---	---	---	---	---
1931	61.1	59.4	63.1	---	---	---	---	---	---	---	---	---
1930	59.7	58.1	61.6	---	---	---	---	---	---	---	---	---
1929	57.1	55.8	58.7	---	---	---	---	---	---	---	---	---
Death-registration states												
1928	56.8	55.6	58.3	---	---	---	---	---	---	---	---	---
1927	60.4	59.0	62.1	---	---	---	---	---	---	---	---	---
1926	56.7	55.5	58.0	---	---	---	---	---	---	---	---	---
1925	59.0	57.6	60.6	---	---	---	---	---	---	---	---	---
1924	59.7	58.1	61.5	---	---	---	---	---	---	---	---	---
1923	57.2	56.1	58.5	---	---	---	---	---	---	---	---	---
1922	59.6	58.4	61.0	---	---	---	---	---	---	---	---	---
1921	60.8	60.0	61.8	---	---	---	---	---	---	---	---	---
1920	54.1	53.6	54.6	---	---	---	---	---	---	---	---	---
1919	54.7	53.5	56.0	---	---	---	---	---	---	---	---	---
1918	39.1	36.6	42.2	---	---	---	---	---	---	---	---	---
1917	50.9	48.4	54.0	---	---	---	---	---	---	---	---	---
1916	51.7	49.6	54.3	---	---	---	---	---	---	---	---	---
1915	54.5	52.5	56.8	---	---	---	---	---	---	---	---	---
1914	54.2	52.0	56.8	---	---	---	---	---	---	---	---	---
1913	52.5	50.3	55.0	---	---	---	---	---	---	---	---	---
1912	53.5	51.5	55.9	---	---	---	---	---	---	---	---	---
1911	52.6	50.9	54.4	---	---	---	---	---	---	---	---	---
1910	50.0	48.4	51.8	---	---	---	---	---	---	---	---	---
1909	52.1	50.5	53.8	---	---	---	---	---	---	---	---	---
1908	51.1	49.5	52.8	---	---	---	---	---	---	---	---	---

See footnotes at end of table.

Table 13. Estimated life expectancy at birth, in years, by race and Hispanic origin and sex: Death-registration states, 1900–1928, and United States, 1929–2018—Con.

[For selected years, life table values shown are estimates; see Technical Notes. Beginning in 1970, excludes death of nonresidents of the United States; see Technical Notes]

Area and year	All races and origins			Hispanic[1]			Non-Hispanic white			Non-Hispanic black[2]		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Death-registration states—Con.	Bridged race[4]—Con.											
1907.	47.6	45.6	49.9	---	---	---	---	---	---	---	---	---
1906.	48.7	46.9	50.8	---	---	---	---	---	---	---	---	---
1905.	48.7	47.3	50.2	---	---	---	---	---	---	---	---	---
1904.	47.6	46.2	49.1	---	---	---	---	---	---	---	---	---
1903.	50.5	49.1	52.0	---	---	---	---	---	---	---	---	---
1902.	51.5	49.8	53.4	---	---	---	---	---	---	---	---	---
1901.	49.1	47.6	50.6	---	---	---	---	---	---	---	---	---
1900.	47.3	46.3	48.3	---	---	---	---	---	---	---	---	---

... Category not applicable.

--- Data not available.

[1]Life tables by Hispanic origin are based on death rates that have been adjusted for race and ethnicity misclassification on death certificates. Updated classification ratios were applied to data years 2010–2015; see Technical Notes.

[2]Before 1970, data for the black population are not available. Data shown for 1900–1969 are for the nonwhite population. See Technical Notes.

[3]Includes Alaska in 1959 and Hawaii in 1960.

[4]Life expectancies by single-race categories are not completely comparable with life expectancies by bridged-race categories and should be interpreted taking account of the change from bridged-race to single-race categories.

[5]Life expectancies for 2001–2018 were calculated using a revised methodology described in the Technical Notes.

[6]Life expectancies for 2001–2009 have been re-estimated using new intercensal population estimates and may differ from data previously published; see Technical Notes.

[7]Deaths based on a 50% sample.

[8]Figures by race exclude data for residents of New Jersey; see Technical Notes.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Technical Notes

The life table program

Two series of complete life tables for the U.S. population are prepared by the National Center for Health Statistics (NCHS). *Decennial life tables* are based on decennial U.S. Census data and final deaths for a 3-year period around the census year. Annual final life tables (referred to here as "annual life tables") are based on a complete count of all reported deaths.

Available since 1945, the annual life tables are based on deaths occurring during the calendar year and on midyear postcensal population estimates provided by the U.S. Census Bureau. From 1945 through 1996, the annual life tables were abridged life tables, closed at age 85 and over, and were constructed by reference to a standard table (4). Beginning with 1997 mortality data, a new methodology similar to that of the 1989–1991 decennial life tables was used to estimate annual complete life tables to age 100, with combined life table values presented for ages 100 and over (12). The methodology was again revised for data years 2000–2007 using a methodology similar to that of the 1999–2001 decennial life tables (13). Beginning with data year 2008, the life table methodology was refined by changing the smoothing technique used to estimate the life table functions at the oldest ages (14).

The methodology used to estimate the 2008–2018 life tables is different from that used to estimate the 2000–2007 life tables with respect to the technique used to estimate the probabilities of death for ages over 65. The methodology used to produce the life tables for 2008–2018 does not model the probabilities of death beginning at age 66, as was done for data years 2000–2007, but rather at ages above 85 or so. (The exact ages at which smoothing techniques are used depends on the specific racial and ethnic population.) Research into the methodology developed and used for the 1999–2001 decennial life tables and applied to the annual life tables has revealed that it is not necessary to model (or "smooth") the probabilities of death beginning at age 66. The observed blended vital statistics and Medicare data for ages 66–85 are robust enough and do not require additional smoothing (14). A full description of the methodology used to estimate the 2018 life tables is provided below. See "United States Life Tables, 2005" (13) for a detailed description of the methodology used for data years 2000–2007.

Beginning with 2006 mortality data, life tables by Hispanic origin were added to the annual life table program. Before this time, concerns over data limitations such as racial and ethnic misclassification on U.S. death certificates and lack of Medicare data for older populations other than the white and black populations prevented the estimation of life tables for the Hispanic origin population. Recent research that identified and quantified these data limitations has led to the development of reliable methodological strategies to address these data problems (9,15–17). The methodology developed to estimate life tables for the Hispanic and non-Hispanic white and non-Hispanic black populations is described in detail below and in "United States Life Tables by Hispanic Origin" (15).

Revised intercensal life table values

Life table values for 1960–1969, 1970–1979, and 1980–1989 were constructed using the U.S. decennial life tables for 1959–1961, 1969–1971, and 1979–1981, respectively, as the standard tables. The life table values for years before 1989 appearing in this report are based on revised intercensal estimates of the populations for those years. As a result, the life table values for these years may differ from the life table values for those years published in Vital Statistics of the United States for 1989 and earlier years (https://www.cdc.gov/nchs/products/vsus.htm). Life table values for 1991–1999 presented in this report are based on postcensal population estimates of the population enumerated in the 1990 decennial census. Life table values for 2001–2009 presented in this report are based on revised intercensal population estimates based on the 2010 decennial census and the revised methodology used to estimate the 2008–2018 life tables (14). As a result, the values may differ from those previously published in annual final mortality and life table reports. The revised intercensal life tables for years 2001–2009 can be accessed by links provided under each of the annual life table reports in: https://www.cdc.gov/nchs/products/life_tables.htm.

Geographic coverage

The geographic areas covered in life tables before 1929–1931 were limited to death-registration areas. Life tables for 1900–1902 and 1909–1911 were constructed using mortality data from the 1900 death-registration states (10 states and the District of Columbia), and tables for 1919–1921 used mortality data from the 1920 death-registration states (34 states and the District of Columbia). The tables for 1929–1931 through 1958 cover the coterminous United States. Decennial life table values for the 3-year period 1959–1961 were derived from data that include both Alaska and Hawaii for each year. Data for each year shown in Table 13 include Alaska beginning in 1959 and Hawaii beginning in 1960. However, it is believed that the inclusion of these two states does not materially affect life table values.

New Jersey data, 1962–1964

The life tables for 1962 and 1963 for the six population groups involving race do not include data from New Jersey, which omitted the item on race from its certificates of live birth, death, and fetal death in use at the beginning of 1962. The item was restored during the latter part of 1962. However, the certificate revision without this item was used for most of 1962, as well as for 1963. For computing vital rates, populations by age, race, and sex (excluding New Jersey) were estimated to obtain comparable denominators. Approximately 7% of the New Jersey death records for 1964 did not contain the race designation. When the records were being electronically processed for this state, the "race not stated" deaths were allocated proportionally to white or black.

Nonresidents

Beginning in 1970, the deaths of nonresidents of the United States have been excluded from the life table statistics.

Data for calculating life table functions

The data used to prepare the U.S. life tables include final death counts from the National Vital Statistics System (NVSS), population estimates from the U.S. Census Bureau, and death and population counts for Medicare beneficiaries aged 66–99 from the Centers for Medicare & Medicaid Services (CMS).

Vital statistics data

Death counts used for computing the life tables presented in this report are final numbers of deaths for 2018 collected from death certificates filed in state vital statistics offices and reported to NCHS as part of NVSS. Hispanic origin and race are reported separately on the death certificate.

Beginning with the 2018 data year, all 50 states and the District of Columbia reported deaths based on the 2003 revision of the U.S. Standard Certificate of Death for the entire year (5). The revision is based on the 1997 Office of Management and Budget (OMB) standards (6). The 1997 standard allows individuals to report more than one race and increased the race choices from four to five by separating the Asian and Pacific Islander groups. The Hispanic category did not change.

The Hispanic origin and race groups in this report follow the 1997 standard and differ from the race categories used in previous reports. The new categories are Hispanic, non-Hispanic white, and non-Hispanic black or African American. For 2003–2017, not all deaths were reported using the 2003 certificate revision that allowed the reporting of more than one race based on the 1997 OMB race standard (8). During those years, multiple-race data were bridged to the 1977 standard single-race categories. Use of the bridged-race process was discontinued for the reporting of mortality statistics in 2018 when all states collected data on race according to 1997 OMB guidelines for the full data year. Life expectancy estimates for bridged-race categories are included in this report for years 2006–2018 to document the effect of the change in race standards and inform the interpretation of trends. Estimates for bridged-race categories will continue to be calculated through data year 2020 for this purpose. The Hispanic origin category was not affected by the revised standards.

Census population data

The population data used to estimate the life tables shown in this report are postcensal population estimates based on the 2010 decennial census and are available from the U.S. Census website at: https://www2.census.gov/programs-surveys/popest/datasets/2010-2018/state/asrh/sc-est2018-alldata6.csv. Reflecting the 1997 OMB guidelines on race and ethnicity reporting, the 2010 census included an option for individuals to report more than one race and provided for the reporting of Asian persons separately from Native Hawaiian or Other Pacific Islander persons (6).

To produce death rates for 2000–2017, it was necessary to bridge the reported population data for multiple-race persons back to the 1977 OMB standard race categories; this included reporting the data for Asian persons and Native Hawaiian or Other Pacific Islander persons as a combined category (Asian or Pacific Islander) and reflecting age as of the census reference date (8). The procedures used to produce the bridged populations are described elsewhere (18).

Medicare data

Medicare data have traditionally been employed in the estimation of U.S. decennial life tables, and in the estimation of U.S. annual life tables since 1997 (12). Medicare data are considered to be more accurate than vital statistics and census data at the oldest ages because Medicare enrollees must have proof of age to enroll (19). However, the reliability of Medicare data beyond age 100 declines because of the small percentage of persons who enrolled at the start of the Medicare program in 1965 and for whom it was not possible to verify exact age (19). Further, the Medicare race and ethnicity classification system makes it impossible to correctly identify the Hispanic, American Indian or Alaska Native, and Asian or Pacific Islander populations (15,20). It is, however, possible to use Medicare data to estimate old-age mortality for both the white and black race groups, irrespective of Hispanic origin, as has been done traditionally, and to estimate old-age mortality for the non-Hispanic segments of these populations (15). As a result, data from the Medicare program are used to supplement vital statistics and census data for ages 66–99 for the total population and the non-Hispanic white and non-Hispanic black populations (15).

To estimate death rates for the Medicare total and non-Hispanic white and non-Hispanic black populations in 2018, age-specific numbers of deaths and population counts by sex and race for the population aged 66–99 from the 2018 Medicare file were used. The data file is created by CMS for the Social Security Administration, which under a special agreement shares the data with NCHS. The 2018 file contains 2018 mid-year Medicare population counts (June 30, 2018) and calendar year Medicare death counts (January 1 through December 31, 2018). Age for both deaths and mid-year population counts is calculated as age at last birthday.

Preliminary adjustment of the data

Adjustments for unknown age

An adjustment is made to account for the small proportion of deaths each year for which age is not reported on the death certificate. The number of deaths in each age category is adjusted proportionally to account for those with not-stated ages. The following factor (F) is used to make the adjustment. F is calculated for the total and for each sex group within a racial and ethnic population for which life tables are constructed:

$$F = \frac{D}{D^a} \qquad [1]$$

where D is the total number of deaths and D^a is the total number of deaths for which age is stated. F is then applied by multiplying it by the number of deaths in each age group. Table I shows the values for F by sex used to adjust mortality data for the total, Hispanic, non-Hispanic white, and non-Hispanic black populations in 2018.

Table I. Values for *F* used to adjust for not-stated age based on 2018 mortality data

Race, Hispanic origin, and sex	Total deaths	Total deaths for which age was not stated	F
Total	2,839,205	144	1.00005072
Male	1,458,469	109	1.00007474
Female	1,380,736	35	1.00002535
Hispanic	204,719	12	1.00005862
Male	113,045	8	1.00007077
Female	91,674	4	1.00004363
Non-Hispanic white	2,182,552	47	1.00002153
Male	1,108,848	34	1.00003066
Female	1,073,704	13	1.00001211
Non-Hispanic black	341,408	13	1.00003808
Male	177,958	11	1.00006182
Female	163,450	2	1.00001224

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Adjustment for misclassification of Hispanic origin and race on death certificates

The latest research evaluating Hispanic origin and race reporting on U.S. death certificates found that the misclassification of Hispanic origin and race on death certificates in the United States accounts for a net underestimate of 3% for total Hispanic deaths, a net underestimate of less than 0.5% for total non-Hispanic black deaths, and no under- or overestimate for total non-Hispanic white deaths or for the population racially classified as white or black, irrespective of Hispanic origin (9). These results are based on a comparison of self-reported Hispanic origin and race on Current Population Surveys (CPS) with Hispanic origin and race reported on the death certificates of a sample of decedents in the National Longitudinal Mortality Study (NLMS) who died during the period 1999–2011 (9).

NLMS-linked records are used to estimate sex–age-specific ratios of CPS Hispanic origin and race counts to death certificate counts (9,16,17). The CPS/death certificate ratio, or "classification ratio," is the ratio of the weighted count of self-reported race and ethnicity on CPS to the weighted count of the same racial or ethnic category on the death certificates of the sample of NLMS decedents described above. It can be interpreted as the net difference in assignment of a specific Hispanic origin and race category between the two classification systems and can be used as a correction factor for Hispanic origin and race misclassification (9,16,17). The assumption is made that the race and ethnicity reported by a CPS respondent is more reliable than proxy reporting of race and ethnicity by a funeral director who has little personal knowledge of the decedent. Further, public policy embodied in the 1997 OMB standard mandates that self-identification should be the standard used for the collection and recording of race and ethnicity information (6).

The NLMS-based classification ratios discussed above are used to adjust the age-specific number of deaths for ages 1–95 and over for the total Hispanic, non-Hispanic white, and non-Hispanic black populations, and by sex for each group, as follows:

$$_nD_x = {_nD_x^F} \cdot {_nCR_x},$$ [2]

where $_nD_x^F$ is the age-specific number of deaths adjusted for unknown age as described above, $_nCR_x$ is the sex- and age-specific classification ratios used to correct for the misclassification of Hispanic origin and race on death certificates, and $_nD_x$ is the final age-specific counts of death adjusted for age and Hispanic origin and race misclassification. Table II shows values of the sex- and age-specific classification ratios, $_nCR_x$, by Hispanic origin and race for the non-Hispanic population (black and white).

Because NLMS classification ratios for infant deaths are unreliable due to small sample sizes, corrections for racial and ethnic misclassification of infant deaths are addressed by using infant death counts and live birth counts from the 2017 and 2018

Table II. Classification ratios by Hispanic origin, race for the non-Hispanic white and black populations, age, and sex

Age (years)	Hispanic			Non-Hispanic white			Non-Hispanic black		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
All ages	1.0329	1.0362	1.0294	0.9995	0.9993	0.9997	1.0047	1.0041	1.0053
0[1]	1.0428	1.0041	1.0458	0.9817	0.9294	0.9866	1.0327	0.999	1.0393
1–14	0.9905	0.9659	*1.0299	0.9918	1.0755	0.8770	1.0266	0.9379	*1.1751
15–24	0.9668	0.9325	1.0604	0.9976	1.0019	0.9869	1.0248	1.0215	1.0343
25–34	1.0354	1.0401	1.0232	1.0021	1.0034	0.9994	0.9855	0.9770	1.0008
35–44	1.0434	1.0645	1.0066	0.9980	0.9997	0.9951	1.0062	1.0073	1.0048
45–54	1.0584	1.0372	1.0953	0.9969	0.9965	0.9976	1.0002	1.0019	0.9982
55–64	1.0571	1.0517	1.0659	0.9994	0.9992	0.9997	1.0003	0.9965	1.0046
65–74	1.0295	1.0485	1.0072	0.9967	0.9967	0.9966	1.0062	1.0055	1.0070
75–84	1.0192	1.0188	1.0196	1.0004	1.0003	1.0004	1.0057	1.0057	1.0058
85–94	1.0208	1.0313	1.0137	1.0008	1.0007	1.0009	1.0110	1.0155	1.0086
95 and over	1.0732	1.0509	1.0842	1.0005	0.9995	1.0008	0.9980	0.9872	0.9954

* Ratio does not meet National Center for Health Statistics standards of reliability because either the unweighted number of Current Population Survey deaths or the unweighted number of death certificate deaths or both are based on fewer than 20 deaths.

[1] Ratios for age 0 are estimated as the ratio of infant mortality rates based on the traditional death and birth files to the infant mortality rates based on the 2018 linked birth/infant death data file. Ratios are shown for illustrative purposes only; see text for details.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

linked birth/infant death data files rather than the traditional birth and death data files (21,22). In the linked file, each infant death record is linked to its corresponding birth record so that the race and ethnicity of the mother reported on the birth record can be ascribed to the infant death record. As a result, race- and ethnicity-specific infant mortality rates estimated with the linked file do not suffer from the problem of racial and ethnic discrepancies between the numerator and denominator of the rate. A ratio of infant mortality rates based on the traditional birth and death data files to infant mortality rates based on the linked birth/infant death data file shows that using the traditional files overestimates the infant mortality rate by 4.3% for Hispanic and 3.3% for non-Hispanic single-race black infants, and underestimates the rate by 2.0% for non-Hispanic single- race white infants (see ratios for age 0 in Table II). Because the probability of death at age 0 used to calculate the life table uses live births in the denominator (procedure described below), it is preferable to use the linked birth/infant death data file.

Note that although there is no conclusive evidence supporting return migration as a factor in the lower mortality of the Hispanic population, the possibility remains that Hispanic deaths are missed in NVSS due to return migration, and, therefore, the resulting death rates may be biased irrespective of correction for ethnic misclassification (15).

Interpolation of P_x and D_x

Anomalies—both random and those associated with reporting age at death—can be problematic when using vital statistics and census data by single years of age to estimate the probability of death (1,12). Graduation techniques are often used to eliminate these anomalies and to derive a smooth curve by age. Beers' ordinary minimized fifth difference formula is used to obtain smoothed values of population counts (P_x) and death counts (D_x) from 5-year age groupings of $_nP_x$ from age 0 to 99 and $_nD_x$ from age 5 to 99, and where $_nD_x$ has first been adjusted for not-reported age and Hispanic origin and race misclassification on the death certificate (see reference 12 for details on the application of Beers' method).

Calculation of the probability of dying (q_x)

The first step in the calculation of a complete period life table is the estimation of the age-specific probability of dying, q_x, which is derived from the age-specific death rate, m_x (3,23). In the life table cohort,

$$m_x = \frac{d_x}{L_x}$$

where d_x is the number of deaths occurring between ages x and $x + 1$, and L_x is the number of person-years lived by the life table cohort between ages x and $x + 1$. The conversion of the age- specific death rate, m_x, to the age-specific probability of death, q_x, is as follows:

$$q_x = \frac{m_x}{1 + (1 - a_x)m_x} \qquad [3]$$

where a_x is the number of person-years lived in the age interval by members of the life table cohort who died in the interval.

When the age interval is 1 year, except at infancy, $a_x = 1/2$; in other words, deaths occur on average midway through the age interval. As a result,

$$q_x = \frac{m_x}{1 + \frac{1}{2}m_x} \qquad [4]$$

Because the complete period life table is based on the age- specific death rates of a current population observed for a specific calendar year, the life table death rate is equivalent to the observed death rates of the current population:

$$m_x = \frac{d_x}{L_x} = M_x = \frac{D_x}{P_x}$$

where D_x is the Beers' smoothed number of deaths adjusted for not-stated age and Hispanic origin and race misclassification on the death certificate (for the Hispanic, non-Hispanic single-race white, and non-Hispanic single-race black populations) and P_x is the Beers' smoothed population at risk of dying between ages x and $x + 1$. Then,

$$q_x = \frac{M_x}{1 + \frac{1}{2}M_x} = \frac{D_x}{P_x + \frac{1}{2}D_x} \qquad [5]$$

This procedure is used to estimate vital statistics age- specific probabilities of death for ages 1–99.

Calculation of q_x at age 0

The higher mortality observed in infancy is associated with a high concentration of deaths occurring at the beginning of the age interval rather than in the middle. As a result, whenever possible, it is best to assign deaths to the appropriate birth cohorts. Therefore, the probability of death at birth, q_0, is calculated using a birth cohort method that employs a separation factor (f) defined as the proportion of infant deaths in year t occurring to infants born in the previous year ($t - 1$). The value f is estimated by categorizing infant deaths by date of birth. The probability of death is then calculated as:

$$q_0 = \frac{D_0(1-f)}{B^t} + \frac{D_0(f)}{B^{t-1}} \qquad [6]$$

where D_0 is the number of infant deaths adjusted for not-stated age in 2018, B^t is the number of live births in 2018, and B^{t-1} is the number of live births in 2017. Table III shows separation factors and numbers of births for 2017 and 2018.

Probabilities of dying at the oldest ages for the total, white, black, non-Hispanic single-race white, and non-Hispanic single-race black populations

Medicare data are used to supplement vital statistics data for the estimation of q_x at the oldest ages because these data are more accurate given that proof of age is required for enrollment in the Medicare program. Medicare data are used here to estimate

Table III. Births in 2017 and 2018, deaths in 2018 of infants born in 2017 and 2018, and separation factors, by Hispanic origin, race, and sex: United States

Births, deaths, and separation factors	Total			Hispanic			Non-Hispanic single-race white			Non-Hispanic single-race black		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Births:												
2017................	3,855,500	1,972,885	1,882,615	898,764	457,788	440,976	2,030,493	1,041,692	988,801	587,357	298,690	288,667
2018................	3,791,712	1,938,179	1,853,533	886,210	450,950	435,260	1,994,985	1,023,007	971,978	579,174	293,777	285,397
Deaths in 2018 of infants born in:												
2017................	2,670	1,495	1,175	530	291	239	1,133	648	485	773	431	342
2018................	18,797	10,573	8,224	3,957	2,211	1,746	7,760	4,343	3,417	5,354	3,027	2,327
Separation factor, f......	0.124	0.124	0.125	0.118	0.116	0.120	0.127	0.130	0.124	0.126	0.125	0.128

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

the probability of dying for ages 66 and over for the total, white, black, non-Hispanic single-race white, and non-Hispanic single-race black populations.

The method described in this section consists of the following steps. First, vital statistics and Medicare death rates are blended in the age range 66–99. Second, a logistic model is used to smooth the blended death rates in the age range 85–99 and to predict death rates for ages 100–120. Third, final resulting death rates, M_x, are converted to q_x.

For ages 66–94, vital statistics death rates, M_x^V, and Medicare death rates, M_x^M, are blended with a weighting process that gives gradually declining weight to vital statistics data and gradually increasing weight to Medicare data. For ages 95–99, M_x^M is used exclusively. Blended M_x is thus obtained as follows:

$$M_x = \frac{1}{30}[(95-x)M_x^V + (x-65)M_x^M]$$ [7]

when $x = 66,...,94$

$$\text{and } M_x = M_x^M$$

when $x = 95,...,99$.

M_x^M is estimated as follows:

$$M_x^M = \frac{D_x^M}{P_x^M}$$

where D_x^M is the age-specific Medicare death count, and P_x^M is the age-specific Medicare midyear population count.

A logistic model proposed by Kannisto is then used to smooth M_x in the age range 85–99 and to predict M_x in the age range 100–120 (24). The start of the modeled age range varies by race- and ethnicity-specific population because it is a function of the age at which the rate of change in the age-specific death rates peaks. In current times, the rate of change in the age-specific death rate rises steadily up to approximately ages 80–85 and then begins to decline. As a result, it is difficult to model a large age span, such as 65–100, with one simple model without over smoothing and thus altering the underlying mortality pattern observed in the population of interest (25). Further, the observed data for the age range 65–85 or so is reliable and robust, as indicated by the very close similarity between vital statistics and

Medicare death rates, so it is unnecessary to model (smooth) the entire age span of 65–100.

The Kannisto model is a simple form of a logistic model in which the logit of u_x (or the natural log of the odds of u_x) is a linear function of age x (24). It is expressed as:

$$\ln[\frac{u_x}{1-u_x}] = \ln(\alpha) + \beta x$$ [8]

where u_x, the force of mortality (or the instantaneous death rate), is defined as:

$$u_x = \frac{\alpha e^{\beta x}}{1+\alpha e^{\beta x}}$$

Because u_x is not directly observed but is closely approximated by m_x, and $m_x = M_x$, then the logit of M_x is modeled instead. A maximum-likelihood generalized linear model estimation procedure is used to fit the following model in the age range 85–99 years:

$$\ln[\frac{M_x}{1-M_x}] = \ln(\alpha) + \beta x$$ [9]

Then, the estimated parameters are used to predict $\bar{M}_x$ as follows:

$$\bar{M}_x = \frac{e^a e^{bx}}{1+e^a e^{bx}} \text{ or, equivalently, } \bar{M}_x = \frac{e^{a+bx}}{1+e^{a+bx}}$$ [10]

where a and b are the predicted values of parameters $\ln(\alpha)$ and β, respectively, given by fitting model equation 9. Estimated parameters and the starting age for the modeled age span by population in 2018 are presented in Table IV.

Finally, the predicted probability of death, $\bar{q}_x$, for ages 85–120 is estimated by converting $\bar{M}_x$ as follows:

$$\bar{q}_x = \frac{\bar{M}_x}{1+\frac{1}{2}\bar{M}_x}$$ [11]

The probability of death is extrapolated to age 120 to estimate the life table population until no survivors remain. This

Table IV. Estimated parameters α and β used for predicting m_x and starting age of modeled age span: United States Life Tables, 2018

Parameter	Total			Non-Hispanic white			Non-Hispanic black		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Starting age	86	86	86	86	86	86	85	84	86
$\ln(\alpha)$	−13.94057	−13.87015	−14.57279	−14.10761	−14.20239	−14.71050	−11.20915	−10.77863	−12.09259
(SE)	(0.064)	(0.229)	(0.054)	(0.064)	(0.216)	(0.047)	(0.090)	(0.050)	(0.222)
β	0.1357590	0.1370387	0.1415885	0.1379163	0.1410469	0.1434018	0.1045428	0.1020385	0.1133180
(SE)	(0.001)	(0.003)	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)	(0.001)	(0.002)

NOTE: SE is standard error.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

information is then used to estimate L_x for ages 100–120, which is used to close the table with the age category 100 and over, combined (discussed below).

Probabilities of dying at the oldest ages for the Hispanic population

As noted above, Medicare data are unreliable for the Hispanic population due to inconsistencies in the Medicare race and ethnicity classification system. As a result, it was necessary to use other methods to estimate mortality at the oldest ages for this population. Beyond age 80, mortality estimates based strictly on vital statistics for the Hispanic population are too low, despite correction for ethnic misclassification on the death certificate.

A consistent finding across diverse studies has been that Hispanic mortality in the adult and advanced ages varies between approximately 80% and 89% of that of the non-Hispanic single-race white population (9,15–17,26,27). The Brass relational logit model takes advantage of the relationship between Hispanic and non-Hispanic single-race white mortality previously identified and has been widely and successfully used to predict the mortality of one population relative to another at the older ages (3,28,29). Using the age-specific mortality pattern of the non-Hispanic single-race white population as the "standard," the Brass relational logit model is used to predict Hispanic mortality in the older ages. The standard is fit to Hispanic data in the age interval 45–80, and the predicted parameters are used to estimate the probabilities of death for ages 76–100. This method allows the relationship between the two populations in the younger ages to be carried over to the older ages (3,28,29).

The Brass relational logit model expresses the age-specific mortality pattern of a population of interest as a function of the age-specific mortality pattern of a standard population and is expressed as:

$$\bar{Y}_x = \alpha + \beta Y_x^s \qquad [12]$$

where $\bar{Y}_x$ is the predicted logit of the probability of death, q_x, in the population of interest, i.e.,

$$\text{logit}\,[q_x] = \ln\left[\frac{q_x}{1-q_x}\right]$$

Y_x^S is the logit of the probability of death in the standard population, q_x^S, i.e.,

$$\text{logit}\,[q_x^S] = \ln\left[\frac{q_x^S}{1-q_x^S}\right]$$

α is the predicted parameter that measures the level of mortality of the population of interest relative to the standard population, and β is the predicted parameter that measures the slope of the mortality function of the population of interest relative to the standard population (3,28,29). Table V shows values of predicted α and β and their standard errors.

A maximum-likelihood generalized linear model estimation procedure is used to fit equation 12 in the age range 45–80. The resulting predicted parameters α and β were then used to estimate the predicted probability of death for ages 76–120 in the Hispanic population. The value q_x, was predicted to age 120 to estimate the life table population until no survivors remain, as was done for the other population groups. This information is then used to estimate L_x for ages 100–120, which is used to close the table with the age category 100 and over, combined (discussed below).

Predicted $\bar{q}_x$, is estimated by transforming its logit, $\bar{Y}_x$, back as follows:

$$\bar{q}_x = \frac{\exp[\bar{Y}_x]}{1+\exp[\bar{Y}_x]} = \frac{\exp[\alpha+\beta Y_x^s]}{1+\exp[\alpha+\beta Y_x^s]} \qquad [13]$$

To ensure a smooth transition from vital q_x^V and predicted $\bar{q}_x$, the two were blended from ages 76 to 80 with a graduating process as follows:

$$q_x = \frac{1}{6}[(81-x)q_x^V + (x-75)\bar{q}_x] \qquad [14]$$

when $x = 76,...,80$.

Finally, to close the table at age 100 and over (combined), $_\infty q_{100}$ is set equal to 1.0 because all survivors to this age will die at some point in the open-ended age interval. After q_x is obtained for each single year of age, the other life table functions are easily calculated.

Table V. Estimated Brass relational logit model parameters α and β for Hispanic origin population, 2018

Parameter	Total (SE)	Male (SE)	Female (SE)
α	−0.25563 (0.022)	−0.2112788 (0.029)	−0.1999785 (0.020)
β	1.00911 (0.006)	1.0089590 (0.007)	1.032884 (0.005)

NOTE: SE is standard error.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Calculation of remaining life table functions for all groups

Survivor function (l_x)

The life table radix, l_0, is set at 100,000. For ages greater than 0, the number of survivors remaining at exact age x is calculated as:

$$l_x = l_{x-1}(1 - q_{x-1}) \qquad [15]$$

Decrement function (d_x)

The number of deaths occurring between ages x and $x + 1$ is calculated from the survivor function:

$$d_x = l_x - l_{x+1} = l_x q_x \qquad [16]$$

Note that $_\infty d_{100} = {}_\infty l_{100}$ because $_\infty q_{100} = 1.0$.

Person-years lived (L_x)

Person-years lived for ages 1–99 is calculated assuming that the survivor function declines linearly between ages x and $x + 1$. This gives the formula:

$$L_x = \frac{1}{2}(l_x + l_{x+1}) = l_x - \frac{1}{2}d_x \qquad [17]$$

For $x = 0$, the separation factor f is used to calculate L_0:

$$L_0 = fl_0 + (1 - f)l_1 \qquad [18]$$

Finally, $_\infty L_{100}$ is estimated as the sum of the extrapolated L_x values for ages 100–120.

Person-years lived at and above age x (T_x)

T_x is calculated by summing L_x values at and above age x:

$$T_x = \sum_{x=0}^{\infty} L_x \qquad [19]$$

Life expectancy at age x (e_x)

Life expectancy at exact age x is calculated as:

$$e_x = \frac{T_x}{l_x} \qquad [20]$$

Abridging the complete life table

An abridged or collapsed version of the complete life table in which life table functions are shown for 5-year rather than single-year age intervals can be easily calculated. It is often desirable to summarize the life table and save space when publishing life table data by single years of age. The abridgement of the complete life table is simplified by an important property of three of the six life table functions. The l_x, T_x, and e_x functions describe exact age x; that is, the beginning of the age interval x to $x + n$ (where n denotes the length of the age interval; for 5-year age intervals, $n = 5$). Life expectancy at age 20 (e_{20}), for example, has the same value regardless of whether the age interval is 20–21 or 20–25. Thus, the values l_x, T_x, and e_x can be extracted at 5-year intervals from the complete life table and placed into the abridged life table (compare l_x, T_x, and e_x in Table VI with the same functions in Table 1). It is also illustrative to compare values for e_x and l_x in Tables A and B with their corresponding values presented in Tables 1–12. The q_x, d_x, and L_x functions, in contrast, describe the age interval x to $x + n$. In fact, for abridged life tables, the notation for these functions is different ($_nq_x$, $_nd_x$, and $_nL_x$, respectively). Thus, $_5q_{20}$ is the probability of dying between ages 20 and 25 and will obviously be somewhat larger than q_{20}, the probability of dying between ages 20 and 21. Taking this into account, $_nq_x$, $_nd_x$, and $_nL_x$ must be recalculated in the abridged life table. It is simplest to begin with $_n d_x$. The calculations are made for all but the final age interval as follows:

$$_nd_x = l_x - l_{x+n}$$

$$_nq_x = \frac{_nd_x}{l_x}$$

$$_nL_x = T_x - T_{x+n}$$

Note that for the open-ended interval, ages 100 and over: $_\infty d_{100} = l_{100}$, $_\infty q_{100} = 1.0$, and $_\infty L_{100} = T_{100}$. Table VI shows each of the life table functions for the 2018 U.S. total population abridged from Table 1.

Table VI. Life table for the total population: United States, 2018

Age (years)	Probability of dying between ages x and $x + n$ $_nq_x$	Number surviving to age x l_x	Number dying between ages x and $x + n$ $_nd_x$	Person-years lived between ages x and $x + n$ $_nL_x$	Total number of person-years lived above age x T_x	Expectation of life at age x e_x
0–1..........................	0.005650	100,000	565	99,505	7,873,749	78.7
1–5..........................	0.000965	99,435	96	397,512	7,774,244	78.2
5–10.........................	0.000577	99,339	57	496,540	7,376,732	74.3
10–15........................	0.000745	99,282	74	496,262	6,880,192	69.3
15–20........................	0.002454	99,208	243	495,513	6,383,930	64.3
20–25........................	0.004500	98,964	445	493,776	5,888,417	59.5
25–30........................	0.005810	98,519	572	491,206	5,394,642	54.8
30–35........................	0.007070	97,946	692	488,056	4,903,436	50.1
35–40........................	0.008693	97,254	845	484,214	4,415,380	45.4
40–45........................	0.010792	96,408	1,040	479,565	3,931,166	40.8
45–50........................	0.015496	95,368	1,478	473,369	3,451,601	36.2
50–55........................	0.023617	93,890	2,217	464,296	2,978,232	31.7
55–60........................	0.036021	91,673	3,302	450,565	2,513,936	27.4
60–65........................	0.051414	88,371	4,543	431,009	2,063,371	23.3
65–70........................	0.071504	83,827	5,994	404,854	1,632,362	19.5
70–75........................	0.105404	77,833	8,204	369,767	1,227,508	15.8
75–80........................	0.164987	69,629	11,488	320,917	857,740	12.3
80–85........................	0.263857	58,141	15,341	253,950	536,823	9.2
85–90........................	0.417699	42,800	17,878	169,639	282,873	6.6
90–95........................	0.617625	24,923	15,393	83,692	113,234	4.5
95–100.......................	0.798470	9,530	7,609	25,355	29,542	3.1
100 and over	1.000000	1,921	1,921	4,187	4,187	2.2

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

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