NATIONAL CENTER FOR HEALTH STATISTICS
NVSS Working Paper Series

Number 001 | November 2, 2026

U.S. State Life Tables - Methodology, 2023

Elizabeth Arias, PhD, Brigham Bastian, BS, Jiaquan Xu, MD, and Betzaida Tejada-Vera, MS

Abstract

- **Objective:** This report presents a description of the data and methodology used to produce complete period life tables for each of the 50 states and the District of Columbia (D.C.), by sex based on age-specific death rates in 2023.
- **Data source:** Data used to prepare the 2023 state-specific life tables include: 2023 final mortality statistics; July 1, 2023, population estimates based on the blended base population estimates produced by the U.S. Census Bureau; and 2023 Medicare data for people aged 66-99.
- **Methods:** The methodology used to estimate the state-specific life tables is the same as that used to estimate the 2023 national life tables, with some modifications.
- **Conclusion:** The 2023 U.S. state life tables add another year to the annual series of U.S. state life tables that began with data year 2018. Links to the complete 2023 period life tables, by sex, for each state and D.C. can be found in Table II.

Introduction

This report presents the data and methods used to estimate the 2023 complete period life tables for the 50 states and D.C. The methods are the same as those used to estimate the U.S. annual life tables, with two modifications (1). First, for states with zero death counts at single ages 1–4 years, linear interpolation was used to replace the zero death counts. Second, a modification was made to the estimation of age-specific death rates for ages 66–99. Because state census population estimates for ages 85–100 are not available, the age ranges were modified for the blended vital-and-Medicare death rate calculation and for the range in which Medicare data are used exclusively. Details of the methodology and modifications follow.

Data

Data for calculating life table functions

The data used to prepare the U.S. state life tables (Table I) include state-specific final death counts from the National Vital Statistics System (NVSS), state-specific population estimates from the U.S. Census Bureau, and state-specific 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 state-specific final numbers of deaths for 2023 collected from death certificates filed in state vital statistics offices and reported to the National Center for Health Statistics (NCHS) as part of NVSS.

Census population data

The population data used to estimate the life tables shown in this report are postcensal population estimates based on the Blended Base created by the U.S. Census Bureau to produce post-2020 census population estimates. The Blended Base consists of a blend of Vintage 2020 postcensal population estimates, based on the April 1, 2010, decennial census; 2020 Demographic Analysis Estimates; and the 2020 Census Edited File (see U.S. Population Estimates Methodology (Vintage 2023)

Medicare data

Data from the Medicare program are used to supplement vital statistics and census data for ages 66–99 for the total population and by sex for each state and D.C.

Medicare data are considered more accurate than vital statistics and census data at the oldest ages because Medicare enrollees must provide proof of age to enroll (2). However, the reliability of Medicare data beyond age 100 declines because of the small percentage of

people who enrolled at the start of the Medicare program in 1965 and for whom it was not possible to verify their exact age (2).

To estimate death rates for the state-specific Medicare populations in 2023, sex- and age-specific numbers of deaths and population counts were used for the population aged 66–99 in each state and D.C. from the 2023 Medicare file. The data file, created by CMS for the Social Security Administration, is shared with NCHS under a special agreement. The 2023 file contains state-specific 2023 midyear Medicare population counts (as of June 30, 2023) and calendar-year Medicare death counts (for January 1 through December 31, 2023). Age for both death and midyear population counts is calculated as age at last birthday.

Methods

Preliminary adjustment of 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 unknown age. An adjustment factor (*F*) is used to distribute deaths with unknown ages. *F* is calculated for the total population and by sex for each state and D.C. as:

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

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.

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 (3). 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 ages 0–99 and ${}_nD_x$ from ages 5–99, and where ${}_nD_x$ has first been adjusted for unknown age on the death certificate (see reference 4 for details on the application of Beers' method). Beers' interpolation is not applied to deaths at ages 0–4.

For states with zero death counts in the age range 1–4 years, the zero counts were replaced using linear interpolation; otherwise, zero death counts would have resulted in discontinuation of the age-specific mortality distribution. The assumption of linearity is warranted because mortality declines somewhat linearly between ages 1 and about 10, and the results yielded

smooth age patterns of mortality (see Table I for a list of states and ages where linear interpolation was used).

Calculation of 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, 5). 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:

$$q_x = \frac{m_x}{1+(1-a_x)m_x} \quad [2]$$

where a_x is the fraction of 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 for infancy, $a_x = 1/2$; in other words, deaths occur, on average, midway through the age interval. As a result,

$$q_x = \frac{m_x}{1+\frac{1}{2}m_x} \quad [3]$$

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 rate 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 (or linearly interpolated) number of deaths adjusted for unknown age and P_x is the Beers' smoothed population at risk of dying between ages x and $x + 1$. Then,

$$q_x = \frac{M_x}{1+\frac{1}{2}M_x} = \frac{D_x}{P_x+\frac{1}{2}D_x} \quad [4]$$

This procedure is used to estimate vital statistics age-specific probabilities of death for ages 1–84.

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. Consequently,

assigning deaths to the appropriate birth cohorts is preferred whenever possible. As a result, the probability of death at birth, q_0, is calculated using a birth cohort method that uses 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 of f is estimated by categorizing infant deaths by date of birth. The probability of death is then calculated as:

$$q_0 = \frac{D_0(1-f)}{B^t} + \frac{D_0(f)}{B^{t-1}} \quad [5]$$

where D_0 is the number of infant deaths adjusted for unknown age in 2023, B^t is the number of live births in 2023, and B^{t-1} is the number of live births in 2022.

Probabilities of dying at oldest ages

Medicare data are used to supplement vital statistics data for the estimation of q_x at the oldest ages. For this method, three steps are followed: 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, the final resulting death rates, M_x, are converted to probabilities of dying, q_x.

For the national life tables, vital statistics, M_x^V, and Medicare, M_x^M, death rates are blended in the age range 66–94 using 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. Because of the unavailability of census state population estimates for ages 85–100, M_x^V cannot be calculated for this age span. As a result, the blending technique was modified such that M_x^V and M_x^M are blended in the age range 66–84, and M_x^M is used exclusively in the age range 85–99. Blended M_x is obtained as:

$$M_x = \frac{1}{20}[(85 - x)M_x^V + (x - 65)M_x^M] \quad [6]$$

when x = 66,...,84

and

$$M_x = M_x^M$$

when x = 85,...,99.

M_x^M is estimated as:

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

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

The exclusive use of Medicare death rates beginning at age 85 for the state life tables is expected to have a negligible biasing effect on mortality at older ages in the life tables compared with the national life tables. While large differences are found between Medicare and vital statistics death rates at ages 85 and older for the U.S. population, blended Medicare and vital statistics death rates are very similar to Medicare death rates for ages 85 and older.

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 (6). The start of the modeled age range varies by sex because it is a function of the age at which the rate of change in the age-specific death rates peaks. Currently, the rate of change in the age-specific death rate rises steadily up to about ages 80–85 and then begins to decline. As a result, modeling a large age span such as 65–100 with one simple model is difficult without oversmoothing and consequently altering the underlying mortality pattern observed in the population of interest (7). Further, the observed data for the age range 65–85 or so are reliable and robust, as indicated by the very close similarity between vital statistics and Medicare death rates, making it unnecessary to model or smooth the entire age span (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 (8). It is expressed as:

$$\ln\left(\frac{u_x}{1-u_x}\right) = \ln(\alpha) + \beta x \qquad [7]$$

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:

$$\ln\left[\frac{M_x}{1-M_x}\right] = \ln(\alpha) + \beta x \qquad [8]$$

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

$$\bar{M}_x = \frac{e^a e^{bx}}{1+e^a e^{bx}}, \text{ or equivalently, } \bar{M}_x = \frac{e^{a+bx}}{1+e^{a+bx}} \qquad [9]$$

where a and b are the predicted values of parameters ln(α) and β, respectively, given by fitting model 8.

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

$$\bar{q}_x = \frac{\bar{M}_x}{1+\frac{1}{2}\bar{M}_x} \qquad [10]$$

The probability of death is extrapolated to age 120 to estimate the life table population until no survivors remain. This information is then used to estimate L_x for ages 100–120, which are used to close the table with the age category 100 and older, combined (see following discussion).

Figures I–III show the age-specific probability of dying, q_x, estimates for each of the 50 states and D.C. compared with those for the United States in 2023. The observed probabilities for the states and D.C. are shown as circles, which appear as vertical bars where they overlap, and the U.S. probabilities are shown as an intersecting connected line. The state estimates fall around the U.S. values as expected, with a few outliers at the youngest childhood ages. These few cases are predominantly the result of a very small number of deaths, consistent with very low mortality in this age range, combined with very small populations in states such as Vermont, Wyoming, and North Dakota. Overall, age-specific estimates for the 50 states and D.C. follow the expected age pattern of mortality and are consistent with the mortality pattern observed for the entire United States.

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

$$l_{x=}\, l_{x-1}(1 - q_{x-1}) \quad [11]$$

Decrement function (d_x)

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

$$d_x = l_x - l_{x+1} = l_x q_x \quad [12]$$

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 are calculated assuming that the survivor function declines linearly between ages x and $x + 1$. This gives the formula:

$$L_x = \frac{1}{2}(l_x + l_{x+1}) = l_x - \frac{1}{2}d_x \quad [13]$$

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

$$L_0 = f l_0 + (1 - f) l_1 \quad [14]$$

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

Person-years lived at age *x* and over (T_x)

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

$$T_x = \sum_{x=0}^{\infty} L_x \quad [15]$$

Life expectancy at age *x* (e_x)

Life expectancy at exact age *x* is calculated as

$$e_x = \frac{T_x}{l_x} \quad [16]$$

Variances and standard errors of probability of dying and life expectancy

The mortality data on which the life tables are based are not affected by sampling error because the data are based on complete counts of deaths. As a result, variances and standard errors reflect only random variation. While measurement errors such as age misreporting are known to affect mortality estimates, they are not considered in the calculation of the variances or standard errors of the life table functions. Because the state life tables presented in this report are based on relatively large numbers of deaths, the variances and standard errors presented are relatively small.

The methods used to estimate the variances of q_x and e_x are based on Chiang (8) with some necessary modifications due to the use of statistical modeling for smoothing and prediction of older-age death rates. Based on the assumption that deaths are binomially distributed, Chiang proposed the following equation for the variance of q_x:

$$Var(q_x) = \frac{q_x^2(1-q_x)}{D_x} \quad [17]$$

where D_x is the age-specific death count. This equation is used to estimate $Var(q_x)$ throughout the age span with modifications to the death count used at different ages. For ages under 66, D_x is the number of deaths from vital statistics data, smoothed by interpolation and adjusted for the number of deaths with age not stated. For ages 66 and over, D_x is obtained by treating the population as a cohort population and calculated from q_x because blended vital statistics and Medicare data were used for estimation (4):

$$P_x = \frac{(P_{x-1} - 0.5D_{x-1})(2 - q_x)}{2}$$

$$D_x = \frac{q_x P_x}{1 - 0.5q_x}$$

Standard error of $\overline{q}_x$

$$SE(q_x) = \sqrt{Var(q_x)} \quad [18]$$

Variances of life expectancies for ages 0–99 are estimated using Chiang's equation:

$$Var(e_x) = \frac{\sum_{x=0}^{x=99} l_x^2 * [(1-.5) + e_x]^2 * Var(q_x)}{l_x^2} \quad [19]$$

Chiang assumed that because $q_{100+} = 1.00$, then $Var(q_{100+}) = 0$, and as a result, $Var(e_{100+}) = 0$. Silcocks et al. proposed that in the final age group, life expectancy is dependent on the mean length of survival and not on the probability of survival, and consequently the assumption of no variance is incorrect. $Var(e_{100+})$ can be approximated as (9):

$$Var(e_{100+}) \approx [\frac{l_{100+}^2}{M_{100+}^4} * Var(M_{100+})]/l_{100+}^2 \quad [20]$$

Standard error of e_x

$$SE(e_x) = \sqrt{Var(e_x)} \quad [21]$$

Conclusion

Links to the complete 2023 period life tables by sex for each state and D.C. can be found in Table II. A ranking of life expectancy at birth by sex for 2023 is provided in Table III. These life tables add another year to the annual series of U.S. state-specific life tables that began with data year 2018 (2018, 2019, 2020, 2021, 2022).

References

1. Arias E, Xu J, Tejada-Vera B. United States Life Tables, 2024. Natl Vital Stat Rep. 2026 Aug 25; 75(5): 1:63.
2. Bell FC, Miller ML. Life tables for the United States Social Security area 1900–2100. Actuarial Study No. 120. SSA Pub. No. 11–11536. Baltimore, MD: Social Security Administration. 2005.
3. Shryock HS, Siegel JS, Larmon EA. The methods and materials of demography, vol 2. Washington, D.C.: U.S. Census Bureau. 1971.
4. Arias E, Curtin SC, Tejada-Vera B. U.S. decennial life tables for 2009–2011, Methodology of the United States life tables. Natl Vital Stat Rep. 2020 Aug;69(10):1–12. PMID: 33054922.
5. Preston SH, Heuveline P, Guillot M. Demography: Measuring and modeling population processes. Oxford: Blackwell Publishers. 2001.
6. Thatcher AR, Kannisto V, Vaupel JW. The force of mortality at ages 80 to 120. Odense, Denmark: Odense University Press. 1998.
7. Andreev KF, Bourbeau RR. Frailty modeling of Canadian and Swedish mortality at adult and advanced ages. In: Population Association of America Annual Meeting program. Silver Spring, MD. 2007.
8. Chiang CL. The life table and its applications. Malabar, FL: Robert E. Krieger Publishing Company, Inc. 1984.
9. Silcocks PB, Jenner DA, Reza R. Life expectancy as a summary of mortality in a population: Statistical considerations and suitability for use by health authorities. J Epidemiol Community Health 55(1):38–43. 2001.

Detailed Tables

Table I. Application of linear interpolation by area, sex, and age, 2023

Area	Male	Female
	Age (years)	
Alaska	4	…
Connecticut	…	3,4
District of Columbia	…	2,3
Hawaii	4	4
Iowa	…	3
Idaho	4	…
Kansas	3	…
Maine	1,2,3	…
Montana	…	1,4
New Hampshire	…	3,4
North Dakota	3,4	4
Oregon	…	4
Rhode Island	4	2
Vermont	…	1,2,3
Wyoming	1,2,4	4

… Category not applicable

Table II. Complete period life tables: 50 states and the District of Columbia, 2023 Available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/nvss/life-expectancy/2023-state-tables/

Table Title
AK-1. Life table for the total population: Alaska, 2023
AK-2. Life table for males: Alaska, 2023
AK-3. Life table for females: Alaska, 2023
AK-4. Standard errors of the probability of dying and life expectancy: Alaska, 2023
AL-1. Life table for the total population: Alabama, 2023
AL-2. Life table for males: Alabama, 2023
AL-3. Life table for females: Alabama, 2023
AL-4. Standard errors of the probability of dying and life expectancy: Alabama, 2023
AR-1. Life table for the total population: Arkansas, 2023
AR-2. Life table for males: Arkansas, 2023
AR-3. Life table for females: Arkansas, 2023
AR-4. Standard errors of the probability of dying and life expectancy: Arkansas, 2023
AZ-1. Life table for the total population: Arizona, 2023
AZ-2. Life table for males: Arizona, 2023
AZ-3. Life table for females: Arizona, 2023
AZ-4. Standard errors of the probability of dying and life expectancy: Arizona, 2023
CA-1. Life table for the total population: California, 2023
CA-2. Life table for males: California, 2023
CA-3. Life table for females: California, 2023
CA-4. Standard errors of the probability of dying and life expectancy: California, 2023
CO-1. Life table for the total population: Colorado, 2023
CO-2. Life table for males: Colorado, 2023
CO-3. Life table for females: Colorado, 2023
CO-4. Standard errors of the probability of dying and life expectancy: Colorado, 2023
CT-1. Life table for the total population: Connecticut, 2023
CT-2. Life table for males: Connecticut, 2023
CT-3. Life table for females: Connecticut, 2023
CT-4. Standard errors of the probability of dying and life expectancy: Connecticut, 2023
DC-1. Life table for the total population: District of Columbia, 2023
DC-2. Life table for males: District of Columbia, 2023
DC-3. Life table for females: District of Columbia, 2023
DC-4. Standard errors of the probability of dying and life expectancy: District of Columbia, 2023
DE-1. Life table for the total population: Delaware, 2023
DE-2. Life table for males: Delaware, 2023
DE-3. Life table for females: Delaware, 2023
DE-4. Standard errors of the probability of dying and life expectancy: Delaware, 2023
FL-1. Life table for the total population: Florida, 2023
FL-2. Life table for males: Florida, 2023
FL-3. Life table for females: Florida, 2023
FL-4. Standard errors of the probability of dying and life expectancy: Florida, 2023
GA-1. Life table for the total population: Georgia, 2023
GA-2. Life table for males: Georgia, 2023
GA-3. Life table for females: Georgia, 2023
GA-4. Standard errors of the probability of dying and life expectancy: Georgia, 2023
HI-1. Life table for the total population: Hawaii, 2023
HI-2. Life table for males: Hawaii, 2023
HI-3. Life table for females: Hawaii, 2023
HI-4. Standard errors of the probability of dying and life expectancy: Hawaii, 2023
IA-1. Life table for the total population: Iowa, 2023

IA-2. Life table for males: Iowa, 2023
IA-3. Life table for females: Iowa, 2023
IA-4. Standard errors of the probability of dying and life expectancy: Iowa, 2023
ID-1. Life table for the total population: Idaho, 2023
ID-2. Life table for males: Idaho, 2023
ID-3. Life table for females: Idaho, 2023
ID-4. Standard errors of the probability of dying and life expectancy: Idaho, 2023
IL-1. Life table for the total population: Illinois, 2023
IL-2. Life table for males: Illinois, 2023
IL-3. Life table for females: Illinois, 2023
IL-4. Standard errors of the probability of dying and life expectancy: Illinois, 2023
IN-1. Life table for the total population: Indiana, 2023
IN-2. Life table for males: Indiana, 2023
IN-3. Life table for females: Indiana, 2023
IN-4. Standard errors of the probability of dying and life expectancy: Indiana, 2023
KS-1. Life table for the total population: Kansas, 2023
KS-2. Life table for males: Kansas, 2023
KS-3. Life table for females: Kansas, 2023
KS-4. Standard errors of the probability of dying and life expectancy: Kansas, 2023
KY-1. Life table for the total population: Kentucky, 2023
KY-2. Life table for males: Kentucky, 2023
KY-3. Life table for females: Kentucky, 2023
KY-4. Standard errors of the probability of dying and life expectancy: Kentucky, 2023
LA-1. Life table for the total population: Louisiana, 2023
LA-2. Life table for males: Louisiana, 2023
LA-3. Life table for females: Louisiana, 2023
LA-4. Standard errors of the probability of dying and life expectancy: Louisiana, 2023
MA-1. Life table for the total population: Massachusetts, 2023
MA-2. Life table for males: Massachusetts, 2023
MA-3. Life table for females: Massachusetts, 2023
MA-4. Standard errors of the probability of dying and life expectancy: Massachusetts, 2023
MD-1. Life table for the total population: Maryland, 2023
MD-2. Life table for males: Maryland, 2023
MD-3. Life table for females: Maryland, 2023
MD-4. Standard errors of the probability of dying and life expectancy: Maryland, 2023
ME-1. Life table for the total population: Maine, 2023
ME-2. Life table for males: Maine, 2023
ME-3. Life table for females: Maine, 2023
ME-4. Standard errors of the probability of dying and life expectancy: Maine, 2023
MI-1. Life table for the total population: Michigan, 2023
MI-2. Life table for males: Michigan, 2023
MI-3. Life table for females: Michigan, 2023
MI-4. Standard errors of the probability of dying and life expectancy: Michigan, 2023
MN-1. Life table for the total population: Minnesota, 2023
MN-2. Life table for males: Minnesota, 2023
MN-3. Life table for females: Minnesota, 2023
MN-4. Standard errors of the probability of dying and life expectancy: Minnesota, 2023
MO-1. Life table for the total population: Missouri, 2023
MO-2. Life table for males: Missouri, 2023
MO-3. Life table for females: Missouri, 2023
MO-4. Standard errors of the probability of dying and life expectancy: Missouri, 2023
MS-1. Life table for the total population: Mississippi, 2023
MS-2. Life table for males: Mississippi, 2023
MS-3. Life table for females: Mississippi, 2023

MS-4. Standard errors of the probability of dying and life expectancy: Mississippi, 2023
MT-1. Life table for the total population: Montana, 2023
MT-2. Life table for males: Montana, 2023
MT-3. Life table for females: Montana, 2023
MT-4. Standard errors of the probability of dying and life expectancy: Montana, 2023
NC-1. Life table for the total population: North Carolina, 2023
NC-2. Life table for males: North Carolina, 2023
NC-3. Life table for females: North Carolina, 2023
NC-4. Standard errors of the probability of dying and life expectancy: North Carolina, 2023
ND-1. Life table for the total population: North Dakota, 2023
ND-2. Life table for males: North Dakota, 2023
ND-3. Life table for females: North Dakota, 2023
ND-4. Standard errors of the probability of dying and life expectancy: North Dakota, 2023
NE-1. Life table for the total population: Nebraska, 2023
NE-2. Life table for males: Nebraska, 2023
NE-3. Life table for females: Nebraska, 2023
NE-4. Standard errors of the probability of dying and life expectancy: Nebraska, 2023
NH-1. Life table for the total population: New Hampshire, 2023
NH-2. Life table for males: New Hampshire, 2023
NH-3. Life table for females: New Hampshire, 2023
NH-4. Standard errors of the probability of dying and life expectancy: New Hampshire, 2023
NJ-1. Life table for the total population: New Jersey, 2023
NJ-2. Life table for males: New Jersey, 2023
NJ-3. Life table for females: New Jersey, 2023
NJ-4. Standard errors of the probability of dying and life expectancy: New Jersey, 2023
NM-1. Life table for the total population: New Mexico, 2023
NM-2. Life table for males: New Mexico, 2023
NM-3. Life table for females: New Mexico, 2023
NM-4. Standard errors of the probability of dying and life expectancy: New Mexico, 2023
NV-1. Life table for the total population: Nevada, 2023
NV-2. Life table for males: Nevada, 2023
NV-3. Life table for females: Nevada, 2023
NV-4. Standard errors of the probability of dying and life expectancy: Nevada, 2023
NY-1. Life table for the total population: New York, 2023
NY-2. Life table for males: New York, 2023
NY-3. Life table for females: New York, 2023
NY-4. Standard errors of the probability of dying and life expectancy: New York, 2023
OH-1. Life table for the total population: Ohio, 2023
OH-2. Life table for males: Ohio, 2023
OH-3. Life table for females: Ohio, 2023
OH-4. Standard errors of the probability of dying and life expectancy: Ohio, 2023
OK-1. Life table for the total population: Oklahoma, 2023
OK-2. Life table for males: Oklahoma, 2023
OK-3. Life table for females: Oklahoma, 2023
OK-4. Standard errors of the probability of dying and life expectancy: Oklahoma, 2023
OR-1. Life table for the total population: Oregon, 2023
OR-2. Life table for males: Oregon, 2023
OR-3. Life table for females: Oregon, 2023
OR-4. Standard errors of the probability of dying and life expectancy: Oregon, 2023
PA-1. Life table for the total population: Pennsylvania, 2023
PA-2. Life table for males: Pennsylvania, 2023
PA-3. Life table for females: Pennsylvania, 2023
PA-4. Standard errors of the probability of dying and life expectancy: Pennsylvania, 2023
RI-1. Life table for the total population: Rhode Island, 2023

RI-2. Life table for males: Rhode Island, 2023
RI-3. Life table for females: Rhode Island, 2023
RI-4. Standard errors of the probability of dying and life expectancy: Rhode Island, 2023
SC-1. Life table for the total population: South Carolina, 2023
SC-2. Life table for males: South Carolina, 2023
SC-3. Life table for females: South Carolina, 2023
SC-4. Standard errors of the probability of dying and life expectancy: South Carolina, 2023
SD-1. Life table for the total population: South Dakota, 2023
SD-2. Life table for males: South Dakota, 2023
SD-3. Life table for females: South Dakota, 2023
SD-4. Standard errors of the probability of dying and life expectancy: South Dakota, 2023
TN-1. Life table for the total population: Tennessee, 2023
TN-2. Life table for males: Tennessee, 2023
TN-3. Life table for females: Tennessee, 2023
TN-4. Standard errors of the probability of dying and life expectancy: Tennessee, 2023
TX-1. Life table for the total population: Texas, 2023
TX-2. Life table for males: Texas, 2023
TX-3. Life table for females: Texas, 2023
TX-4. Standard errors of the probability of dying and life expectancy: Texas, 2023
UT-1. Life table for the total population: Utah, 2023
UT-2. Life table for males: Utah, 2023
UT-3. Life table for females: Utah, 2023
UT-4. Standard errors of the probability of dying and life expectancy: Utah, 2023
VA-1. Life table for the total population: Virginia, 2023
VA-2. Life table for males: Virginia, 2023
VA-3. Life table for females: Virginia, 2023
VA-4. Standard errors of the probability of dying and life expectancy: Virginia, 2023
VT-1. Life table for the total population: Vermont, 2023
VT-2. Life table for males: Vermont, 2023
VT-3. Life table for females: Vermont, 2023
VT-4. Standard errors of the probability of dying and life expectancy: Vermont, 2023
WA-1. Life table for the total population: Washington, 2023
WA-2. Life table for males: Washington, 2023
WA-3. Life table for females: Washington, 2023
WA-4. Standard errors of the probability of dying and life expectancy: Washington, 2023
WI-1. Life table for the total population: Wisconsin, 2023
WI-2. Life table for males: Wisconsin, 2023
WI-3. Life table for females: Wisconsin, 2023
WI-4. Standard errors of the probability of dying and life expectancy: Wisconsin, 2023
WV-1. Life table for the total population: West Virginia, 2023
WV-2. Life table for males: West Virginia, 2023
WV-3. Life table for females: West Virginia, 2023
WV-4. Standard errors of the probability of dying and life expectancy: West Virginia, 2023
WY-1. Life table for the total population: Wyoming, 2023
WY-2. Life table for males: Wyoming, 2023
WY-3. Life table for females: Wyoming, 2023
WY-4. Standard errors of the probability of dying and life expectancy: Wyoming, 2023

SOURCE: National Center for Health Statistics, National Vital Statistics System, mortality data file.

Table III. Life expectancy at birth, rank, and standard error, by sex: Each state, District of Columbia, and United States, 2023

	Total			Male			Female		
Area	Rank	Life expectancy (years)	Standard error	Rank	Life expectancy (years)	Standard error	Rank	Life expectancy (years)	Standard error
New Jersey	1	80.6	0.044	1	78.3	0.065	3	83.0	0.057
Hawaii	2	80.6	0.120	8	77.7	0.174	1	83.8	0.159
Massachusetts	3	80.5	0.049	2	78.2	0.073	6	82.9	0.064
New York	4	80.4	0.031	3	78.0	0.045	4	83.0	0.041
Connecticut	5	80.4	0.072	4	77.9	0.107	5	82.9	0.093
California	6	80.2	0.022	6	77.7	0.033	2	83.0	0.029
Minnesota	7	80.0	0.058	5	77.9	0.083	7	82.2	0.078
Rhode Island	8	79.7	0.132	9	77.3	0.192	8	82.0	0.177
Utah	9	79.6	0.076	7	77.7	0.111	15	81.5	0.102
New Hampshire	10	79.4	0.113	10	77.3	0.166	11	81.7	0.149
Colorado	11	79.3	0.059	12	76.8	0.086	9	81.9	0.076
Idaho	12	79.2	0.100	11	77.1	0.147	18	81.4	0.133
Vermont	13	79.0	0.176	16	76.4	0.269	10	81.7	0.216
Washington	14	79.0	0.051	15	76.5	0.075	12	81.6	0.068
Wisconsin	15	78.9	0.059	13	76.6	0.085	19	81.3	0.079
North Dakota	16	78.8	0.165	20	76.2	0.233	13	81.6	0.225
Florida	17	78.8	0.031	21	76.1	0.046	14	81.6	0.041
Nebraska	18	78.7	0.100	14	76.5	0.143	22	81.0	0.135
Maryland	19	78.7	0.059	23	76.0	0.087	16	81.4	0.077
Illinois	20	78.6	0.041	24	76.0	0.060	17	81.4	0.053
Iowa	21	78.6	0.078	17	76.3	0.113	21	81.1	0.103
Virginia	22	78.5	0.048	22	76.1	0.071	24	80.9	0.064
South Dakota	23	78.4	0.157	19	76.3	0.222	26	80.7	0.218
United States	…	78.4	…	…	75.8	…	…	81.1	…
Pennsylvania	24	78.3	0.040	26	75.8	0.058	23	80.9	0.052
Montana	25	78.3	0.140	18	76.3	0.202	31	80.3	0.190
Oregon	26	78.2	0.070	28	75.5	0.104	20	81.1	0.091
Texas	27	78.1	0.026	27	75.7	0.038	27	80.7	0.034
Arizona	28	77.9	0.055	32	75.1	0.081	25	80.9	0.073
Wyoming	29	77.8	0.190	25	75.8	0.277	34	80.0	0.252
Michigan	30	77.8	0.046	29	75.4	0.067	32	80.3	0.061
Maine	31	77.8	0.125	31	75.2	0.186	29	80.4	0.161
Delaware	32	77.7	0.149	33	74.9	0.223	28	80.5	0.193
Kansas	33	77.6	0.085	30	75.3	0.122	33	80.1	0.115
Nevada	34	77.3	0.083	34	74.6	0.121	30	80.4	0.109
District of Columbia	35	77.3	0.198	35	74.4	0.293	35	80.0	0.265
Georgia	36	76.9	0.045	36	74.3	0.066	38	79.5	0.059
Ohio	37	76.8	0.043	37	74.2	0.063	37	79.5	0.057
North Carolina	38	76.8	0.046	38	74.1	0.067	36	79.6	0.060
Indiana	39	76.6	0.056	39	74.0	0.082	40	79.3	0.075
Missouri	40	76.5	0.060	41	73.8	0.087	39	79.4	0.079
Alaska	41	76.3	0.184	40	73.9	0.256	43	79.0	0.257
South Carolina	42	76.2	0.066	42	73.3	0.098	42	79.1	0.087

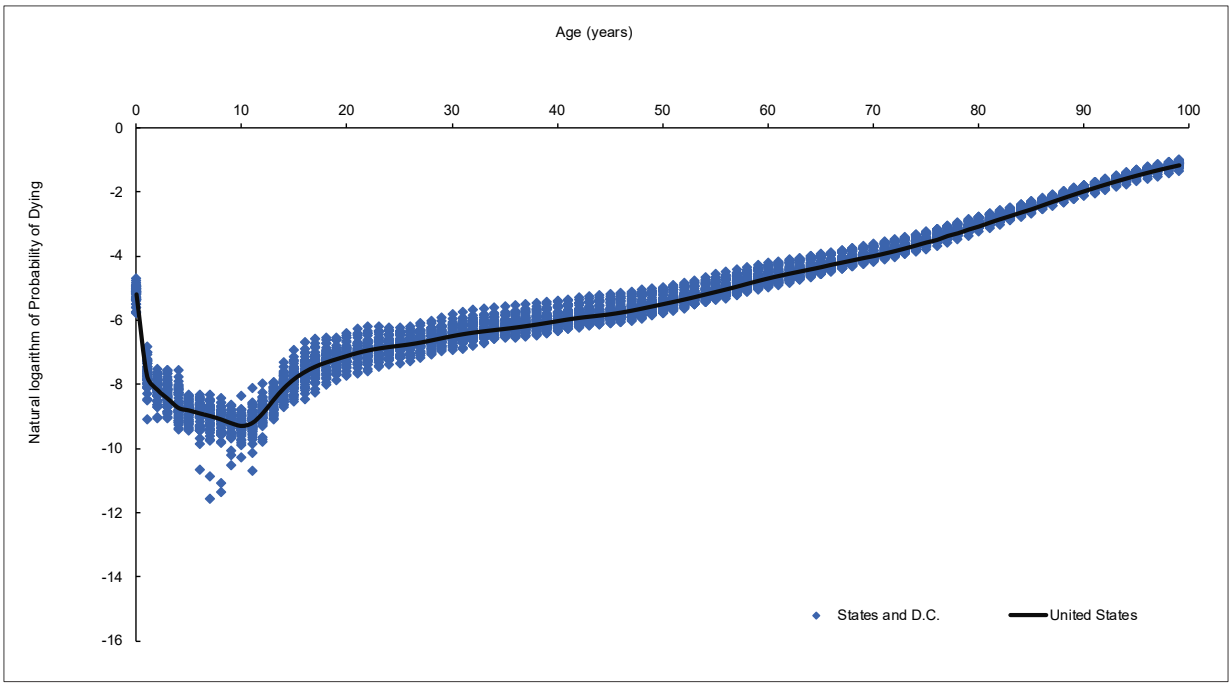
New Mexico	43	75.7	0.111	44	72.3	0.162	41	79.3	0.146
Oklahoma	44	75.1	0.075	43	72.6	0.107	47	77.7	0.101
Tennessee	45	74.9	0.057	47	72.0	0.084	45	77.8	0.075
Arkansas	46	74.8	0.087	45	72.1	0.125	48	77.6	0.117
Louisiana	47	74.8	0.073	48	71.5	0.107	44	78.1	0.095
Kentucky	48	74.6	0.070	46	72.1	0.100	49	77.3	0.095
Alabama	49	74.6	0.068	49	71.5	0.101	46	77.7	0.089
West Virginia	50	73.9	0.116	50	71.2	0.166	51	76.7	0.156
Mississippi	51	73.8	0.092	51	70.7	0.134	50	76.9	0.121

... Category not Applicable.

NOTES: Life expectancies shown in the table are rounded but rankings are based on unrounded life expectancy

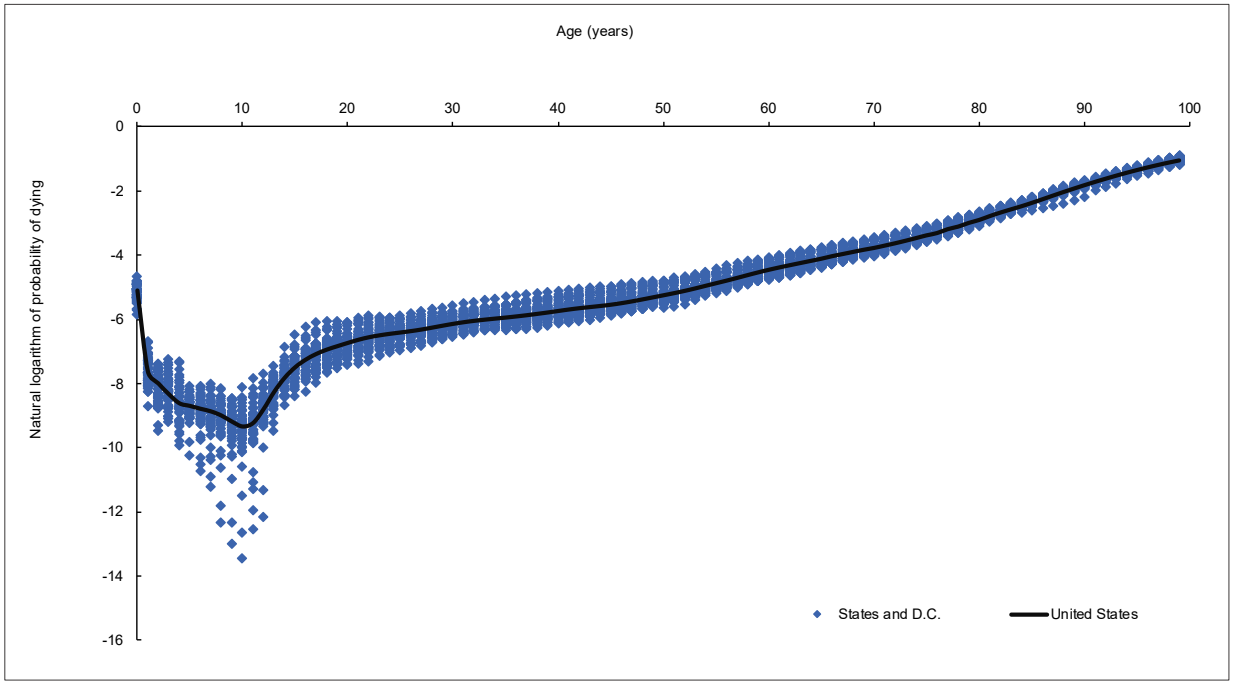
SOURCE: National Center for Health Statistics, National Vital Statistics System, mortality data file.

Figure I. Age patterns of mortality for states and District of Columbia compared with United States, 2023



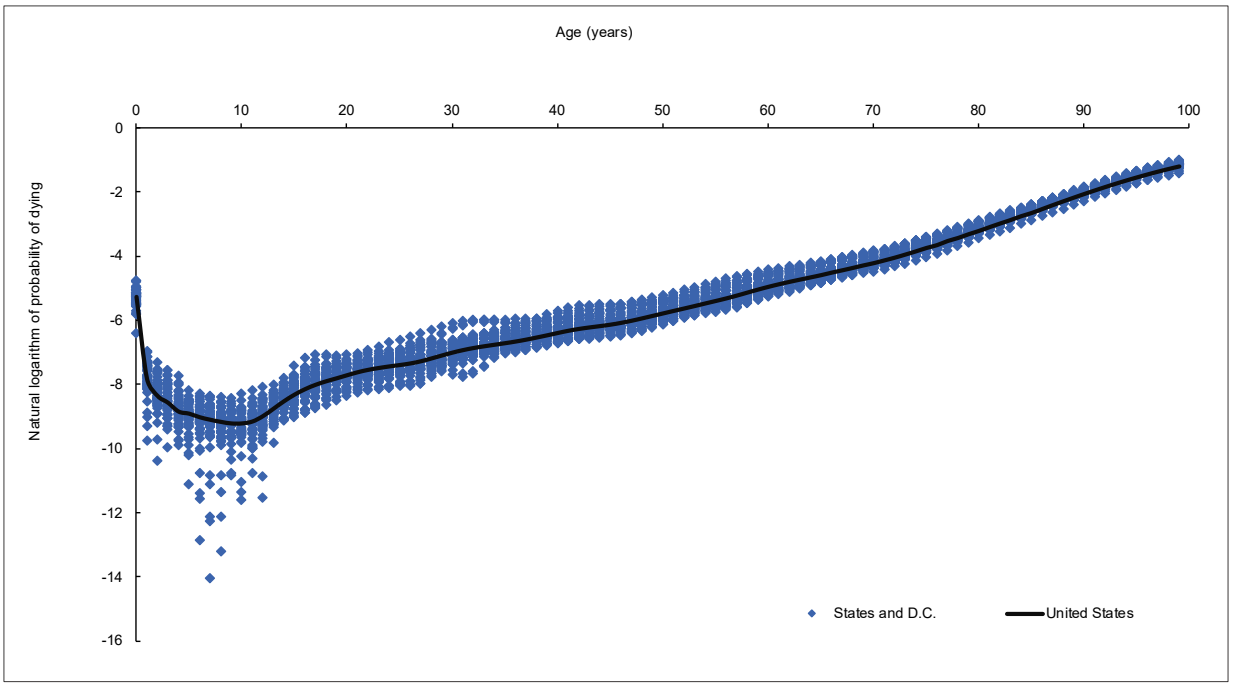
SOURCE: National Center for Health Statistics, National Vital Statistics System, mortality data file.

Figure II. Male age patterns of mortality for states and District of Columbia compared with United States, 2023



SOURCE: National Center for Health Statistics, National Vital Statistics System, mortality data file .

Figure III. Female age patterns of mortality for states and District of Columbia compared with United States, 2023



SOURCE: National Center for Health Statistics, National Vital Statistics System, mortality data file.

Acknowledgments

The authors are grateful for the reviews and comments provided by Robert N. Anderson, Statistical Analysis and Surveillance Branch (SASB), Division of Vital Statistics (DVS); Andrés A. Berruti, DVS; and Amy M. Branum, Office of the Director. The authors thank Brady Hamilton, Danielle Ely, and Anne Driscoll of the Perinatal Statistics and Research Team (PSRT) for their assistance with birth data.

Disclaimer

This working paper has undergone scientific review by the National Center for Health Statistics (NCHS) but has not undergone the routine editorial and publication review process applied to standard NCHS reports. As a result, minor editorial or formatting inconsistencies may be present.

Suggested citation

Arias E, Bastian B, Xu JQ, and Tejada-Vera B. United States Life Tables - Methodology, 2023. *NVSS Working Paper Series.* No. 1. Hyattsville, MD: National Center for Health Statistics; 2026 November 2. doi:10.15620/cdc/252489.

Copyright information

All material appearing in this report is in the public domain and may be reproduced or copied without permission. Citation as to source is appreciated.

National Center for Health Statistics

Carolyn M. Greene, M.D., *Acting Director*
Amy M. Branum, Ph.D., *Associate Director for Science*

Paul D. Sutton, Ph.D., *Director*
Andrés A. Berruti, Ph.D., M.A., *Associate Director for Science*

For email updates on NCHS publication releases, subscribe online:
www.cdc.gov/nchs/updates/.

For questions or general information about NCHS:
Tel: 1–800–CDC–INFO (1–800–232–4636) | TTY: 1–888–232–6348
Internet: www.cdc.gov/nchs | Online request form: www.cdc.gov/info

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