

NOVEMBER 2026

Mortality Differentials and Their Implications for Social Security

American Academy of Actuaries
The Social Security Committee

American Academy of Actuaries

actuary.org

The Social Security Committee, which authored this policy paper, includes

Sam Gutterman, MAAA, FCA, FCAS, FSA—*Chairperson*
Martin Bauer, MAAA, FSA
James Berberian, MAAA, ASA, EA, FCA
Audrey Cervas, MAAA, EA, FSA
Janet Comisky, MAAA, ASA
Stephen Goss, MAAA, ASA
Iris Kazin, MAAA, EA, FCA, FSA
Amy Kemp, MAAA, EA, ASA
Eric Klieber, MAAA, EA, FSA
Piotr Krekora, MAAA, ASA, EA, FCA
Jerry Mingione, MAAA, EA, FSA
Brian Murphy, MAAA, EA, FCA, FSA
John Nylander, MAAA, FSA
Robert Rachlow, MAAA, FSA
Neela Ranade, MAAA, FSA
Craig Rosenthal, MAAA, EA, FCA, FSA
Larry Rubin, MAAA, FCA, FSA
Jeffery Rykhus, MAAA, FSA
Joan Weiss, MAAA, FSA

The Committee gratefully acknowledges the contributions of Ron Gebhardtsbauer, MAAA, FSA.

The American Academy of Actuaries is a 20,000-member professional association whose mission is to serve the public and the U.S. actuarial profession. For 60 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

This paper was developed thanks to the work of the Academy's volunteers. To learn more about becoming a volunteer, please visit actuary.org/volunteer.



AMERICAN ACADEMY OF ACTUARIES
1850 M STREET NW, SUITE 300, WASHINGTON, D.C. 20036
202-223-8196 | WWW.ACTUARY.ORG

© 2026 American Academy of Actuaries. All rights reserved.

November 2026

Any references to current laws, regulations, or practice guidelines are correct as of the date of publication.

Mortality Differentials and Their Implications for Social Security

Executive Summary

Social Security provides a critical financial lifeline for millions of Americans who retire or become permanently disabled. Yet the program's design was built on broad population averages that increasingly mask wide disparities in longevity. Since the program's inception, overall life expectancy has risen significantly–projected to grow by roughly seven years between 1950 and 2050–far outpacing the two-year increase in the Normal Retirement Age (NRA) enacted in 1983. Critically, these gains in life expectancy have not been shared equally, raising equity and fiscal concerns that are important to consider in any Social Security reform.

Key findings presented in this policy paper are:

1. Mortality Differentials Are Pervasive and Growing

Mortality rates vary significantly across demographic, socioeconomic, and behavioral subgroups. In addition to age and sex, relevant disparities include:

- *Income*: The life expectancy gap at age 62 between the highest and lowest earnings quintiles grew from 8.4 years (1930 birth cohort) to 10.3 years (1960 birth cohort) for men, and from 4.6 to 6.4 years for women.
- *Race and ethnicity*: Black and Native Americans face substantially higher mortality rates at younger and middle ages compared to the total population, while Hispanic and Asian Americans show lower-than-average mortality, partly due to a higher proportion of immigrants (who tend to be better than average health risks).
- *Education and marital status*: College-educated and married individuals experience markedly lower mortality rates. Single, divorced, and widowed individuals face mortality rates that are three to four times higher during their working years.
- *Location*: Mortality rates vary dramatically across states and counties—for example, between New York and Louisiana, and between residents living in high- and low-poverty counties.
- *Lifestyle*: Non-smokers, non-obese individuals, and those with no or moderate alcohol consumption experience meaningfully longer lives.

2. Differential Mortality Is Eroding Social Security's Progressivity

Social Security's benefit formula was designed to redistribute income toward lower-wage workers. However, because lower-income individuals tend to die sooner, and improvements in longevity have disproportionately favored higher-income groups, Social Security has become less progressive in practice than intended. Higher-income workers are both more likely to reach retirement age and to receive benefits for significantly longer periods.

3. Current Program Design Partially Accounts for These Differentials

Several existing provisions mitigate, but do not fully offset, the regressive effects of differential longevity:

- Social Security's progressive benefit formula provides higher replacement rates for low-wage earners.
- Disability benefits disproportionately benefit low-income workers, who experience higher rates of disabling conditions.
- Pre-retirement survivor benefits provide partial protection to families of workers who die before reaching retirement age.

Nevertheless, "money's worth" analyses consistently show that higher-income workers benefit more from spousal and survivor benefit structures, partly offsetting the progressive benefit formula.

4. The Importance of Considering the Impacts of Differential Mortality in Reform Proposals

With Social Security facing projected trust fund reserve depletion within the next decade, reform of some kind is inevitable. The policy paper highlights the following considerations for equitable reform:

- Raising the NRA: Further increases to the NRA would disproportionately reduce lifetime benefits for low-income workers and those in physically demanding jobs, whose longevity improvements have been far smaller. Pairing an NRA increase with enhanced benefits at lower income levels would help ensure equitable reform—for example, raising the 90% replacement factor at the first bend point to 97% and increasing the first bend point to the poverty level.

- Benefit formula progressivity: Strengthening the progressive tiers of the benefit formula—potentially by adding a bend point or reducing replacement rates at higher earnings levels—can offset the regressivity introduced by longevity disparities.

- Spousal and survivor benefits: These provisions, designed for an era when single-earner families were the norm, now disproportionately benefit higher-income, lower-mortality married households. It's important for reform proposals to consider the trade-offs of reducing these benefits, so that the money's worth for single and divorced individuals (who face higher poverty and mortality rates) is more equitable (i.e., they can then be almost as good as the money's worth for married individuals).

- Targeted bridge benefits: Workers in physically demanding occupations who cannot retrain for new roles may warrant special bridge benefits if NRA increases are enacted.

The following table highlights key mortality differentials and policy implications:

Group	Mortality Profile	Policy Implication
Low-income workers	Higher mortality; shorter retirement	Need a more progressive benefit formula; exercise caution on an NRA increase
High-income workers	Lower mortality; longer expected benefit period	Reduce upper-bracket replacement rates to improve progressivity
Black & Native Americans	Higher mortality at working ages	Need a more progressive formula and better disability benefits
Hispanic & Asian Americans	Lower mortality (partly due to immigrant effect)	Immigration composition affects aggregate projections
Married individuals	Lower mortality; greater spousal benefits	Spousal benefit reform would reduce inequity compared with singles
Single/divorced	Higher mortality; greater poverty risk	Modify benefit structure to provide stronger safety net
Disabled workers	Higher mortality; earlier benefit onset	Disability benefits partially offset longevity disadvantage

Mortality Differentials and Their Implications for Social Security

- **There are significant differences in mortality and longevity across population groups. The factors affecting mortality are numerous and interrelated.**

- **Some of these differences are growing and can affect the value of Social Security benefits. They have contributed to the current benefit formula becoming less progressive than was originally intended.**

- **The effects of these differences in mortality and longevity should be taken into account when redesigning Social Security benefits.**

Section 1. Introduction

Social Security benefits help provide financial security for many Americans who no longer work due to old age or permanent disability. Under legislation passed in 1983, the age at which unreduced old-age benefits are available gradually increased from 65 to 67 for participants born in 1960 or later.

Since Social Security's enactment, mortality rates[1] have declined at all ages for participants across all recognized sectors of society. As a result, people live longer on average. As longevity has increased, participants, on average, receive Social Security benefits for longer periods. As shown in Table 1, over the 125 years from 1950 to 2075, life expectancy at age 65 is estimated to increase by about 8.5 years (66% for males and 56% for females). These increases far exceed the two-year increase in the unreduced (also called "full" or "normal") old-age benefit commencement age. Since 2010, life expectancy has increased more slowly, and for some population groups, it has even decreased. Table 1 also shows life expectancy at birth, which is often used to indicate a population's overall health.

1 This term, as well as other terms, metrics, and key mortality-related concepts used in this policy paper, are defined and discussed in the *Appendix—Mortality Basics and Terms* on page 20.

Table 1. U.S. Period Life Expectancy (years)

Year	At Age 65		At Birth	
	Males	Females	Males	Females
1950	12.8	15.1	65.6	71.1
1975	13.7	18.0	68.7	76.6
2000	15.9	19.0	74.0	79.4
2025	18.2	20.7	76.7	81.4
2050	19.9	22.3	78.9	83.6
2075	21.3	23.5	81.3	85.5

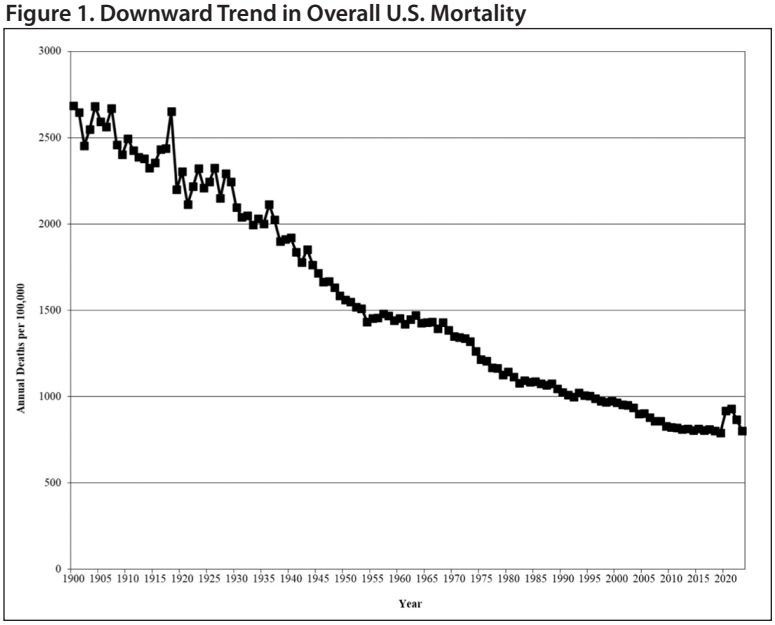
Source: 2026 OASDI Trustees Report, Table V.A4

This policy paper examines evidence that the increase in life expectancy does not affect all groups within a population equally. For example, individuals with higher incomes have disproportionately benefited from longer lifespans compared to those with lower incomes. The effect of such differential mortality is a central focus of the rest of this policy paper.

Numerous factors influence longevity. Positive factors include improvements in infrastructure such as water and sewer systems; reductions in pollution due to the passage of the Clean Air Act and Clean Water Act; advances in public health, such as widespread vaccination against common infectious diseases; reductions in smoking over the past several decades; the year-round availability of a wide array of foods; and improvements in health care diagnostics, treatments, and access to health care. However, these positive developments are not uniformly distributed across society; many people still live with poor infrastructure, high levels of pollution, and limited access to healthy food and health care. There are also adverse factors, including higher rates of obesity, drug addiction, and pandemics, each of which can reduce longevity. Some of these deleterious influences have affected all groups equally, but many contributors have disproportionately harmed certain groups.

Figure 1 illustrates the historical trend in overall mortality over the past century, including short-term increases in 1919 and from 2020 to 2022 due to the influenza and COVID-19 pandemics, respectively. It is reasonable to expect that economic and environmental factors, such as future pandemics, climate disasters, or conflicts, could significantly increase mortality rates over the short term. In contrast, anti-obesity medications or medical breakthroughs in the treatment of heart disease and cancer could significantly reduce mortality.

Figure 1. Downward Trend in Overall U.S. Mortality



Source: Social Security Actuarial Services, The Long-Range Demographic Assumptions for the 2026 Trustees Report, June 9, 2026.

It is worth noting that, over the last several decades, U.S. longevity has fallen behind that of other high-income countries, as shown in Figure 4 on page 8 of a recent Society of Actuaries mortality study.

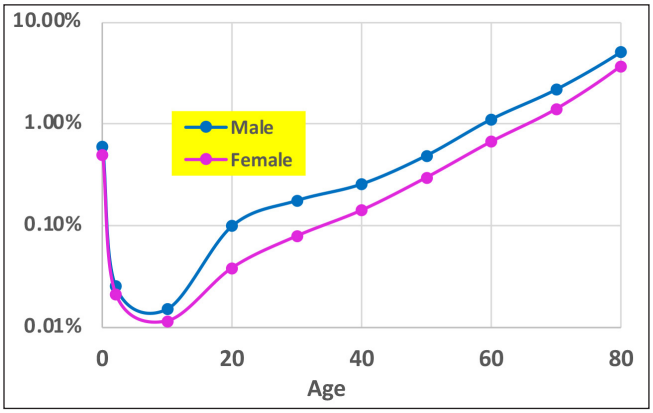
Section 2. Differential Mortality

To gain insight into longevity, it can be helpful to examine its opposite: the risk of death, or mortality. Mortality rates can differ among groups within a population. This is known as differential mortality. Despite the steady increase in overall life expectancy and decline in mortality, the rate of improvement varies across several factors, as discussed in the remainder of this policy paper.

Age and sex are the most commonly used factors in mortality analysis. In fact, these variables are so widely used in mortality statistics that one could easily forget that they represent a range of sources of mortality differentials.

Figure 2 shows that mortality rates vary dramatically by age, with rates at older ages more than a thousand times greater than those at younger ages. Figure 2 shows mortality rates[2] across a broad age range, indicating that, after infancy, mortality rates generally increase exponentially, consistent with the decreasing ability to resist death as we age and with the gradual decline in health.

Figure 2. Probabilities of Dying by Age and Sex—2019



Source: CDC Wonder

Differential mortality at a specific age affects life expectancy at that age and at younger ages. The high rate of mortality at birth only affects life expectancy at birth and not at age 65.

Differences in mortality and life expectancy between men and women have long been recognized and studied. Similar patterns have been observed in most mammals.

Figure 2 also shows that, on average, males have higher mortality rates than females, especially around age 20.[3] This larger gap is primarily driven by the riskier behaviors of males that result in accidents, suicides, and drug overdoses. Overall differences are due to genetic, behavioral, and medical factors.

2 Figure 2 is a semi-log graph so that the rates at the youngest ages can be seen more easily.
3 Another reason for males having higher mortality rates was due to their higher smoking rates, but that has receded due to lower smoking rates for all, per "Mortality of Smoking by Gender."

Figure 3 shows the trend in life expectancy at age 65 since 1940, using period life expectancy. It exhibits an overall pattern of long-term improvement for both sexes, albeit with a temporary decline in longevity from 2020 to 2022, largely attributable to the COVID-19 pandemic. Future economic and environmental factors could produce similar effects and possibly offset these gains.

Figure 3. Life Expectancy in the U.S. by Sex at Age 65[a]

Year	At Birth		At Age 65	
	Males	Females	Males	Females
1940	61.4	65.7	11.9	13.4
1945	62.9	68.4	12.6	14.4
1950	65.6	71.1	12.8	15.1
1955	66.7	72.8	13.1	15.6
1960	66.7	73.2	12.9	15.9
1965	66.8	73.8	12.9	16.3
1970	67.1	74.9	13.1	17.1
1975	68.7	76.6	13.7	18.0
1980	69.9	77.5	14.0	18.4
1985	71.1	78.2	14.4	18.6
1990	71.8	78.9	15.0	19.0
1995	72.5	79.1	15.4	19.0
2000	74.0	79.4	15.9	19.0
2005	74.8	80.0	16.7	19.5
2010	76.1	80.9	17.5	20.2
2015	76.2	80.9	17.8	20.3
2016	76.1	81.0	17.9	20.5
2017	76.0	81.0	17.9	20.4
2018	76.2	81.1	17.9	20.5
2019	76.3	81.3	18.1	20.7
2020	74.2	79.8	16.9	19.6
2021	73.5	79.3	16.9	19.7
2022	74.8	80.2	17.5	20.1
2023[b]	75.8	81.1	18.1	20.7
2024[c]	76.5	81.4	18.3	20.8
2025[d]	76.7	81.4	18.2	20.7

a. The period life expectancy at a given age for a given year is the average remaining number of years expected prior to death for a person at that exact age, born on January 1, using the mortality rates for that year over the course of their remaining life.
b. Estimated using final data for ages below 65 and preliminary data for ages 65 and older.
c. Estimated using preliminary data.
d. Estimated using partial-year, provisional data.
Source: 2026 Trustees Report, Table V.A4

As shown in Figure 3, men experienced smaller gains in life expectancy at age 65 compared with women in the 1960s and 1970s, partly because more men than women smoked, and women benefited disproportionately from better management of hypertension. In contrast, men saw notable increases in the 1990s and 2000s, partly due to advances in the treatment of cardiovascular risk factors. Both sexes benefited from antibiotics, smoking cessation, and improved public health measures. The largest gap in life expectancy between the sexes occurred around 1980.

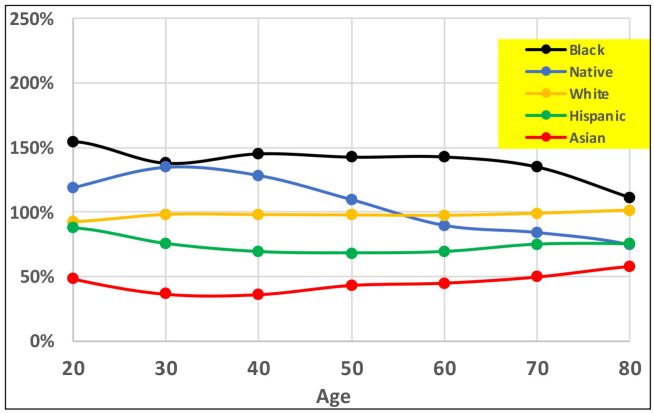
It is easier to analyze differential mortality by plotting mortality ratios (the mortality rates of one group divided by those of another), as shown in Figure 4 for the major U.S. racial and ethnic groups.

Figure 4 shows that the mortality ratios for Hispanic and Asian Americans at each age are below the 100% line, which represents the mortality of the total population. The ratios for white Americans are very close to 100% because they comprise the largest segment of the U.S. population (78%). The mortality ratios for Black and Native Americans are significantly higher than those of the total population at younger and middle ages. However, these differences decline at very old ages as mortality tends to converge (partly because those who survive past those ages are a highly select group).[4]

Overall differences are due to numerous factors, including genetic, socioeconomic, and behavioral differences, as well as the relative proportion of immigrants in each group. For example, there is currently a significant difference in the proportion of Asian Americans and Hispanics born outside the United States (about two-thirds and one-third, respectively). Immigrants have generally lower mortality than the native-born, partly because immigrants tend to be healthier than the native-born population.

4 The mortality rates at ages below 20 were not graphed because the small number of deaths at those ages results in more volatile ratios and may be less indicative of the true rates. Likewise, the mortality rates for ages greater than 80 are also not shown partly because their age distributions are different (i.e., the Native and Black populations over age 80 are younger than the Hispanic and Asian Americans).

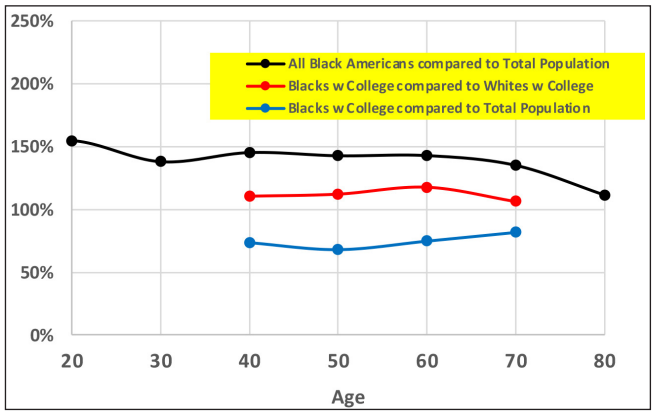
Figure 4. Mortality Ratios by Race/Ethnicity
(as a % of Total Population Mortality—2019)



The high rates for Black and Native Americans decrease at older ages, possibly due to a more highly select group.
Source: CDC Wonder

A simple aggregate comparison between groups can be misleading. For example, Figure 4 suggests that Black Americans generally have higher mortality rates than white Americans. However, much of this difference can be attributed to other socioeconomic and demographic factors. For example, a greater proportion of whites are college-educated, earn more, are married, and own more assets, all of which are inversely related to mortality rates. To see this, let's compare the relative mortality ratios of college-educated Blacks with those of college-educated whites, as shown by the red line in Figure 5. When comparing only those with a college degree, the mortality differences are much smaller. Also, compared to the entire population (the 100% line), the relative mortality of college-educated Blacks is much lower (the blue line).

Figure 5. Mortality Ratios of Black Americans



Source: Penn Wharton Budget Model website

Figures 6 through 10 illustrate significant differences in average mortality rates across population groups. For example, mortality rates are lower (and longevity greater) for those with college degrees (Figure 6), those who are married or were ever married (Figure 7), those with higher lifetime earnings (Figure 8), those with healthier lifestyles, such as non-smokers (Figure 9), and those living in large cities and suburbs (Figure 10).[5] Figure 11 shows that mortality can vary significantly across regions, states, and counties. It presents mortality rates for two states, New York and Louisiana, along with data for two counties with vastly divergent mortality experience.

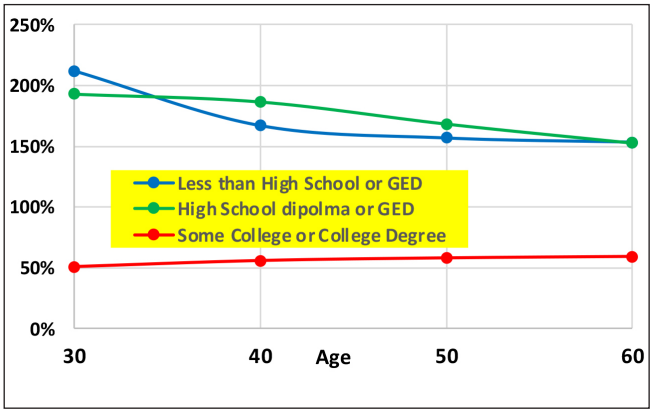
The causes of these mortality differences are subject to debate.[6] For example, the higher mortality rates of certain groups may be affected by that group having a higher proportion of individuals with lower incomes or socioeconomic status, greater distance from doctors or hospitals, lower marriage rates, or higher rates of unhealthy behaviors such as smoking or obesity. These variables, in turn, can be influenced by lower levels of education and socioeconomic status at a younger age. Because these categories overlap and the causes are neither independent nor necessarily causal, mortality differences should be interpreted with caution.

In addition, the direction of causation can be ambiguous. Lower income may lead to poor health, but conversely, poor health can also lead to lower income. It is also important to recognize that Figures 6 through 11 cannot be used to draw firm conclusions regarding causation. For example, lower mortality rates among Hispanics are partly attributable to a higher proportion of immigrants and partly because, on average, they tend to be healthier due to self-selection and lower smoking rates.

Certain behaviors (e.g., obesity, smoking, heavy drinking, and limited social interactions) can be unevenly distributed across subpopulations and, at least in part, explain some of the observed differences in mortality.[7] Over the last few years, the prevalence of these unhealthy habits or conditions in certain subpopulations has decreased relative to the full population. For example, fewer young people in the United States are currently drinking and smoking[8], which might affect differential mortality as they age. However, these declines have been partly offset by increases in vaping and the use of certain other nicotine products, such as ZYN, which have, in many cases, supplanted combustible cigarette smoking.

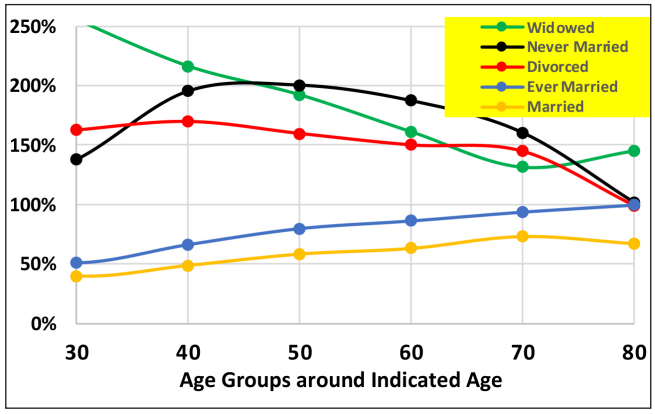
5 Also found in Syndergaard, C., Hartman, B., Richardson, R., & Groendyke, C. (2025). Clustering County-Level Mortality Curves in the United States. *North American Actuarial Journal*, 1–22.
6 See the Academy issue brief, *An Actuarial View of Correlation and Causation—From Interpretation to Practice to Implications* (2022) for a discussion of causation and correlation.
7 For example, mortality rates for those who are severely obese (about ten percent of the adult population) can be twice those of the general population. "Obesity, Mortality, and the Obesity Paradox" shows large increases in the overweight and obese populations, especially in the United States.
8 For example, see Miech, R., Johnston, L., Patrick, M., & O'Malley, P. (2025). Monitoring the Future national survey results on drug use, 1975–2024: Overview and detailed results for secondary school students. Monitoring the Future Monograph Series. Ann Arbor, MI: Institute for Social Research, University of Michigan.

Figure 6. Mortality Ratios by Education Level
(as a % of Total Population Mortality—2019)



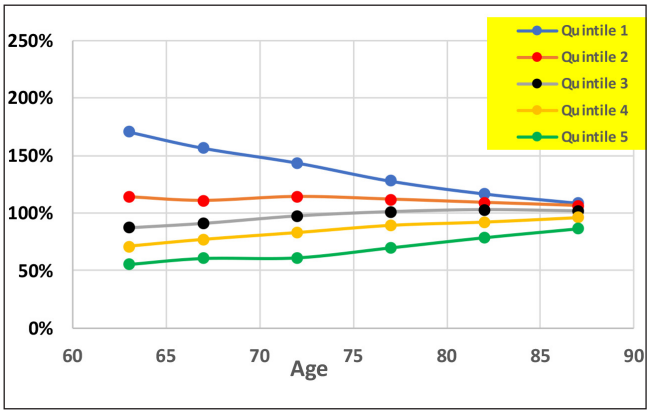
People with some college or a degree live much longer per CDC National Center for Health Statistics Supp Table I-7
Source: cdc.gov

Figure 7. Mortality Ratios by Marital Status
(as a % of Total Population Mortality—2019)



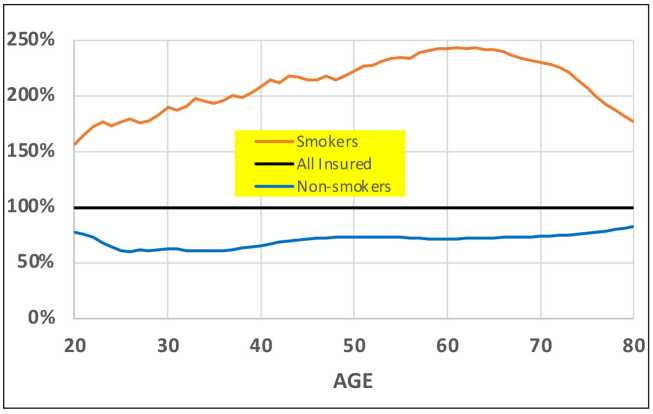
Those who marry live much longer per underlying data from CDC National Center for Health Statistics Table I-6
Source: cdc.gov

Figure 8. Mortality Ratios by Earnings Quintile
(as a % of Total Population Mortality—2020)



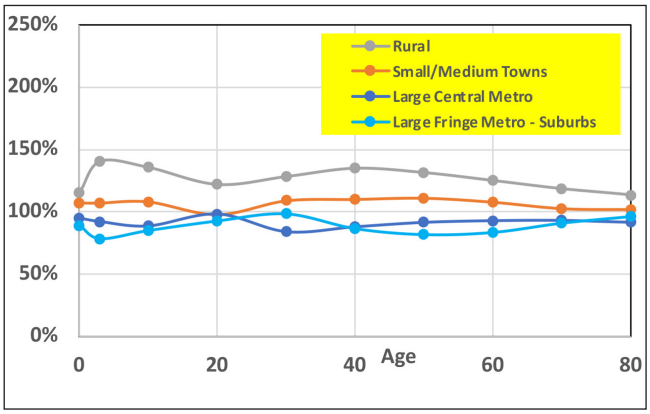
People with higher earnings live longer.
Quintile 1 = bottom 20%; Quintile 5 = top 20%.
Source: SSA Office of the Chief Actuary, Actuarial Study No. 129, Table 6

Figure 9. Mortality Ratios for Smokers
(as a % of Mortality Rate for All Insured People)



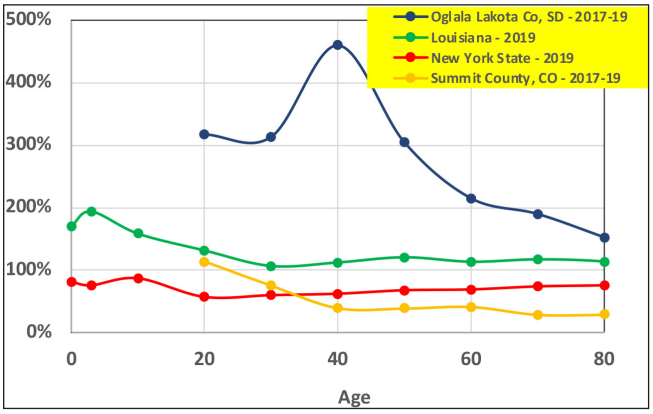
Society of Actuaries 2019 Individual Life Insurance Mortality Experience Report.
Insured people generally have better mortality than the general public.
Source: soa.org

Figure 10. Mortality Ratios by Urbanization
(as a % of Total Population Mortality—2019)



Urban & Suburban people have lower mortality rates
Source: wonder.cdc.gov

Figure 11. Mortality Ratios by Region
(as a % of Total Population Mortality—2019)



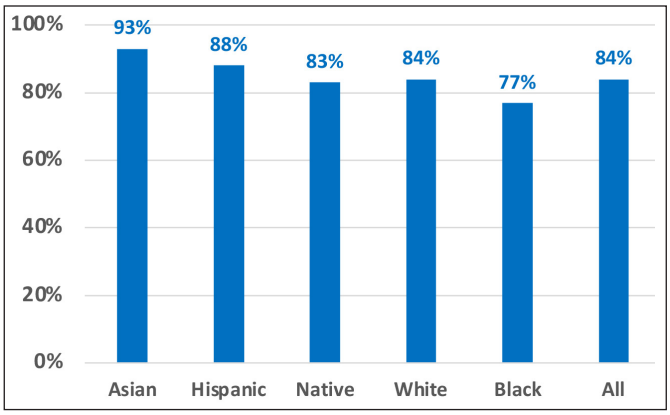
Oglala Lakota County is entirely in an Indian Reservation. Summit County is mostly ski resorts, where people move to lower elevations before they die. Ratios below age 20 are not provided if the data is not significant.
Source: wonder.cdc.gov

Average mortality rates and their annual changes can serve as a basis for projecting a population's life expectancy, provided that the proportions of subpopulations remain roughly constant. However, when the population's composition changes over time, if a subpopulation experiences faster mortality improvement than the overall average, the subpopulations can be analyzed separately, or adjustments can be made for changes in the population mix. This is especially important when benefits differ significantly among groups, as is the case with groups with unequal incomes.

For example, the Hispanic proportion of the U.S. population increased from about 12.5% in 2000 to 19% in 2020 (according to the CDC WONDER database), and the Asian American proportion increased from about 4.2% to 6.5%. Because their mortality rates have generally been lower than those of the U.S. population as a whole, an increasing proportion of these subpopulations should be considered in mortality projections. Another example, as reflected in the annual Trustees Reports, is that because individuals with higher lifetime earnings have experienced lower mortality rates, the average benefit for the entire population increases faster than the cost-of-living adjustment (COLA) over time.

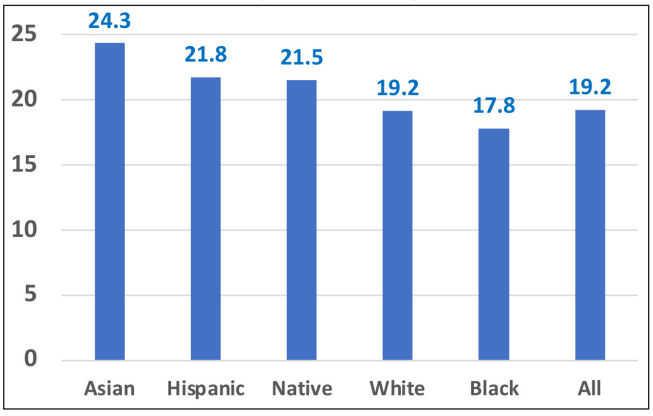
In addition to determining life expectancy, mortality rates can be used to estimate the likelihood that a new worker will live long enough to reach the age at which they can begin receiving Social Security retirement benefits. Figures 12 and 13 illustrate how mortality rates can affect this likelihood. Individuals with lower mortality rates are more likely to receive Social Security benefits and to receive them for a longer period.

Figure 12. Probability New Worker Reaches Age for Social Security Retirement Benefit



Source: Probability someone age 22 born in 1959 reaches age 62, using SSA mortality for general population multiplied by mortality ratios for each group.

Figure 13. Life Expectancy at Age 65 (in years)



Source: SSA mortality for the general population born in 1959 multiplied by mortality ratios for each group. Over 80, average ratio for 80 to 84 used.

Mortality improvements have been smaller among those with lower average lifetime income, so disparities between high-income and low-income individuals have increased, with implications for policies such as raising Social Security's NRA. The growing life expectancy gap between the top and bottom quintiles of lifetime income at age 62 is shown in Table 2. For males, the gap was 8.4 years for the 1930 birth cohort, increasing to 10.3 years for the 1960 cohort, while for females, it rose from 4.6 years to 6.4 years. From another perspective, while life expectancy at age 62 increased by 1.7 years (15.3-13.6) in the lowest quintile, the corresponding increase was 3.6 years (25.6-22.0) in the highest quintile. Although disparities in life expectancy between women and men were smaller, they have been widening over time between the earnings cohorts.

Table 2. Disparity in Life Expectancy at age 62 for the 1930 and 1960 Birth Cohorts for Men and Women by Average Indexed Monthly Earnings (AIME) Quintile

		Lowest	2nd	3rd	4th	Highest	Total
Men	**1930 cohort**	13.6	16.8	18.4	19.9	22.0	18.1
	1960 cohort	15.3	18.8	21.3	23.5	25.6	20.9
Women	**1930 cohort**	18.3	20.6	22.1	23.2	22.9	21.4
	1960 cohort	19.7	23.2	24.5	25.1	26.1	23.7

Source: Letter to Hoyer/Primus from Social Security Actuarial Services (2025), page 18

The increasing disparity in mortality over time can also be seen in Figures 14A and 14B, taken from page 23 of SSA's Actuarial Study #129. They show mortality ratios for ages 70-74 by earnings quintile for both sexes (as a percentage of each sex's average mortality rate), with an increasing spread over the period shown, indicating a widening gap in mortality rates by income level. These conclusions have also been reached in studies of mortality experience by socioeconomic group in U.S. counties.[9]

9 Barbieri, M. (2022). Mortality by Socioeconomic Category in the United States. Society of Actuaries Research Institute.

Figure 14. Mortality Ratios for Ages 70-74

Figure 14A. By Earnings Quintile as % of Total Male Mortality

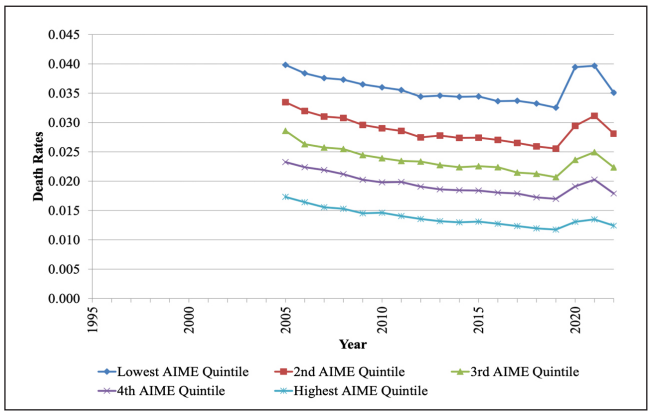
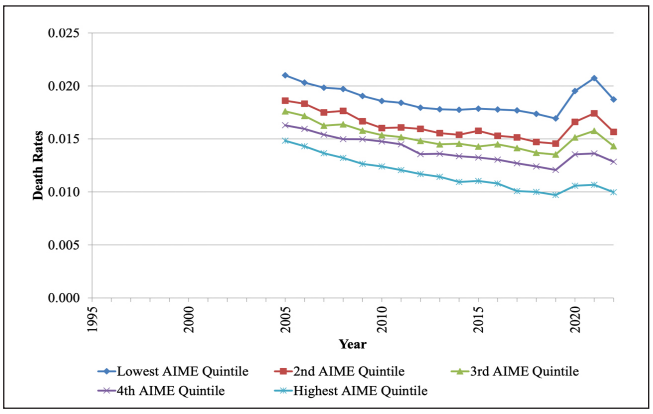


Figure 14B. By Earnings Quintile as % of Total Female Mortality

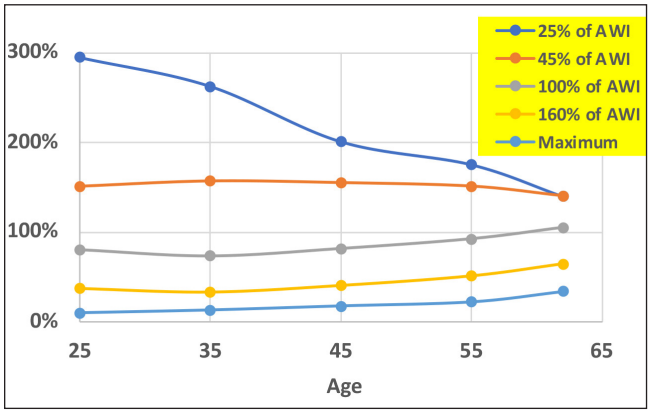


Source: SSA Office of the Chief Actuary, Actuarial Study No. 129, Mortality by Career-Average Earnings Level (December 2024).

2A. Differential Disability

As might be expected, the incidence of disability is higher among low-income individuals, especially among younger males, as shown in Figure 15. A Social Security Actuarial Note[10] indicates that higher disability incidence improves the internal rates of return and the money's worth of Social Security for lower-income workers, sometimes more than offsetting the effects of their shorter lifespans after age 65, which would otherwise reduce the internal rates of return and the money's worth of their retirement benefits.

Figure 15. Disability Ratios by AIME as % of AWI as % of Aggregate Disability Incidence Rates



AIME is Avg Indexed Monthly Earnings
AWI is Average Wage Index
Those with lower earnings have much higher disability incidence rates, especially at younger ages.
Source: SSA's Office of the Chief Actuary.

10 The disability ratios in Figure 15 are the average of the ratios for males and females provided by Social Security Actuarial Services, using select data from SSA's 2022 Continuous Work History Sample (CWHS) and summarized in their Actuarial Notes 2024.5 and 2024.7 on Social Security's Internal Rates of Return and Money's Worth.

Section 3. Differential Mortality in the Current Social Security Program

Section 2 demonstrates that differential mortality applies to a range of subgroups within the U.S. population, including age, sex, race and ethnicity, income and education levels, marital status, disability status, smoking status, and geographic area. Further, these factors are correlated with one another in a complex web of interrelationships.

Social Security's benefit provisions explicitly take into account three of these factors:

- *Income level*. The benefit formula provides larger benefits relative to pre-retirement earnings for low-wage workers and, by association, for members of other high-mortality groups. This favors individuals with lower incomes and higher mortality rates.

- *Marital status*. Social Security provides an additional benefit to some surviving spouses after the death of a primary worker, equal to 50 percent of the worker's benefit if the spouse is not eligible for a higher benefit based on their own earnings. Spousal benefits are typically paid to spouses who remain out of the labor force for extended periods to care for children or elderly parents. This benefit favors low-mortality groups because workers in these groups are more likely to be married and to support a family on a single income.

- *Disability status*. A relatively larger share of low-wage workers become eligible for disability benefits, as shown in Figure 15. Although disabled workers may experience higher than average mortality, disability benefits usually begin earlier than old age benefits and are potentially payable for a long period. Also, because disabled workers are generally younger when benefits start, they are likely to have more dependents eligible for benefits. Both factors favor high-mortality groups.

In addition, Social Security provisions that appear to treat all workers the same can affect them differently depending on when they die and their dependents.

- *A worker who dies before* being eligible for old-age or disability benefits will not be paid any of these benefits. Figure 12 shows the probability that a new participant at age 22 will survive to age 62, the earliest age at which they can begin collecting old-age benefits. Although overall averages indicate that about 84% of those aged 22 will reach age 62, the probability varies across groups—for example, it is 77% for Black Americans and 93% for Asian Americans; probabilities for other subgroups fall between these two.

- *If a worker dies* before becoming eligible for old-age benefits, their dependents, including their spouse, children, and, in limited circumstances, parents, may become eligible for survivor benefits. These relationships result in greater benefits to certain high-mortality groups.

- *How long a worker lives beyond the point at which* Social Security benefits begin will determine how many benefit payments the worker will receive. Figure 13 shows the average expected number of years of retirement benefits. According to SSA mortality data, retiree beneficiaries who commence receiving benefits at age 65 are expected to receive about 19.2 years of benefits, ranging from 17.8 years for Black Americans to 24.3 years for Asian Americans. During this period, their dependents can also receive benefits.

Social Security Actuarial Services regularly publishes "money's worth" ratios for hypothetical workers at different income levels. These ratios can be used to compare the value of benefits to the accumulated value of Social Security taxes paid on the worker's behalf. They account for all Social Security benefits, weighted by the probability that a participant will receive them. The most recent study was published in December 2025.

These money's worth ratios shed light on how benefit design affects workers at different income levels. All studies to date show that money's worth ratios decrease as income increases. This suggests that factors that favor workers in high-mortality groups, namely, the progressive benefit formula and disability and pre-retirement death benefits, provide greater benefits than factors favoring workers in low-mortality groups, including a higher likelihood of surviving to retirement and a longer period of benefit receipt. However, they do not reflect that higher-income workers are more likely to be married to spouses who receive the spousal dependent and survivor benefits.

Section 4. Impact on Individuals of Differential Longevity

Differential mortality expectations can help individuals estimate their life expectancy at retirement. Recognizing their expected lifespan (for example, based on their parents' longevity and their current health status) can influence how much to save and whether to purchase an annuity.

If individuals believe their life expectancy is longer than average, this belief could influence when they decide to begin collecting Social Security benefits. People with longer life expectancies can receive a higher total income from Social Security if they delay claiming benefits until age 70, due to the subsidized actuarial increase for a deferred start. For example, to receive greater overall value from Social Security, healthy individuals who are Hispanic, Asian American, married, hold a college degree, or have higher lifetime earnings might consider delaying the start of their Social Security benefits. As a result, the mortality of those who decide to begin their old-age benefits at age 62 is greater than that of those who begin at older ages.

Section 5. Differential Mortality and Social Security Reform

Within the next decade, Social Security will face significant financial challenges.[11] Many proposals have been put forward to reform the system to prevent trust fund depletion and restore its long-term actuarial balance. These proposals can affect workers differently depending on their mortality profile.

It is important that proposed reform packages consider the impact of differential mortality, as discussed below.

- Normal retirement age (NRA).[12] When Social Security last faced imminent trust fund depletion in 1983, the response was to gradually raise the age for unreduced old-age benefits from 65 to 67 for workers born in 1960 and later. The increase was justified in part by increasing life expectancy. However, as noted above, life expectancy has risen more for high-income than low-income workers. Thus, the increase in the NRA reduced lifetime benefits by a greater proportion for low-income workers.

  Some reform proposals have included raising the Social Security NRA above 67 for new beneficiaries to receive full benefits, citing increasing life expectancies. However, this overlooks the effects on groups with shorter expected lifespans whose longevity hasn't improved nearly as much (e.g., those with lower incomes or in physically demanding employment), who may be adversely affected. Many in these groups receive lower benefits and have a shorter life expectancy. Policymakers might consider increasing benefits for those with lower incomes to offset the impact of the increase in the NRA.

11 See the Academy's policy paper, *An Actuarial Perspective on the 2025 Social Security Trustees Report*.
12 See the Academy's issue brief, *Raising the Social Security Retirement Age.*

One option would be to increase the 90% replacement rate through the first bend point in the benefit formula to 97%. That would offset the impact of increasing the NRA by one year for everyone whose Average Indexed Monthly Earnings (AIME) is below that bend point.[13] In addition, the first bend point could be increased to the poverty level. The net impact on benefits of this alternative would be similar to only raising the NRA for those with a higher AIME. Increasing the benefit formula may be easier to understand and simpler than an NRA that varies by AIME. In addition, the benefit formula could reduce the early-retirement penalty for individuals with lower AIMEs.

- If any financially disadvantaged group[14] doesn't, on average, live as long as the general population, the value they receive from a dollar of Social Security benefits will be less than that for other groups and might be less than the value of what they contributed over their lifetime, with interest. In such cases, policymakers might seek ways to improve the situation for those not expected to live as long.

- Increasing benefits below the first bend point makes the formula more progressive, but also more costly. The additional cost could be offset by reducing the 32 percent and 15 percent formula factors applied to higher wages, or by introducing an additional bend point with an even smaller percentage.

- Social Security benefits were designed when a much higher share of families consisted of a working husband and a stay-at-home wife who cared for children. A married person with limited labor force participation receives a benefit based on 50 percent of the spouse's benefit while the spouse is in pay status and 100 percent of the spouse's benefit after the spouse's death. These benefits favor high-income, low-mortality workers, who are married and more likely to be able to support a family on a single income. Proposals have been made to reduce or eliminate these benefits to lower system costs and to respond to changes in family structure over the past decades.[15] These proposals would decrease the money's worth gap between married and single people at the same income levels.

13 Making the benefit formula more progressive indirectly helps high-income people with short work histories in covered employment because their average earnings can be low. To avoid that, the Rep. Johnson "Mini PIA" modification could be adopted. An alternative is the first provision of the Simpson-Bowles proposal, which doesn't increase the NRA for low-income people with long work histories, but it has cliffs and multiple NRAs that can be confusing. Another method that addresses this concern for people with covered and non-covered employment (double dippers) was proposed by Rep. Neal. It also addresses the double dipper concern.
14 See Academy issue brief, *Social Security and the Financially Disadvantaged*.
15 See Academy policy paper, *Evolving Family Structures and Social Security*.

Single, divorced, and widowed people are more likely to live in poverty.[16] These groups have mortality rates that are three to four times higher than those of married people during their working years and one to two times higher in their retirement years (see Figure 7). The higher mortality in their retirement years reduces their money's[17] worth, but this can be partly or fully offset by the increased value of their disability and survivor benefits.

Although men, on average, don't live as long as women, a Supreme Court case considered it inappropriate to give men larger pensions than women who have earned the same amount. However, on average, (1) men receive more disability benefits than women because of their higher rates of disability, and (2) men have higher wages than women on average, leading to larger retirement incomes and savings.

People with less education, poorer health, living in poorer regions, and rural workers are also in the same situation. These groups are somewhat correlated with low AIMEs, so they will also benefit from the more progressive benefit formula and from disability and survivor benefits.

Conclusion

It is important to consider the effects of differential mortality across population groups when evaluating benefit options in Social Security reform proposals, as they can alter the distribution of Social Security benefits. Reforms that assume all workers have the same longevity may systematically disadvantage low-income individuals, minority groups, and those in physically demanding occupations—populations the program is meant to protect. While the existing benefit structure incorporates certain progressive benefit features, such as disability benefits and survivor provisions, the growing divergence in life expectancy has eroded the program's redistributive features.

As longevity gaps widen, especially by income and socioeconomic status, consideration of policy changes, such as more progressive benefits, alternative spousal benefit approaches, and bridge benefits for those who cannot maintain their prior occupation, will be needed. A reform package that accounts for differential mortality may better provide financial security and promote greater equity and broad-based economic security for all Americans, regardless of income, background, or health status.

16 See Academy issue brief, *Social Security and the Financially Disadvantaged*.
17 It is unlikely that their much higher mortality and disability incidence is reflected in the money's worth and internal rates of return calculations.

Appendix—Mortality Basics and Terms

1. ***Mortality*** is the risk of death within a specified period, typically one year.

2. A ***mortality rate*** is the fraction of people of a certain age who die before reaching the next higher age, often expressed per 100,000 individuals. It is expected to change over time due to factors such as healthier lifestyles and breakthroughs, including the introduction of new or improved diagnostic tools. Typically, these risks vary not only by age and sex, but also by other ***risk characteristics***.

   The CDC (Centers for Disease Control and Prevention) uses information on death certificates to determine the number of deaths, along with other information, such as the decedent's age, sex, race, ethnicity, education levels, marital status, death date, and location. The number of people in the denominator of the mortality rates is obtained from the U.S. Census Bureau as of the applicable midyear.

3. A ***mortality table*** is a set of mortality rates for each age that reflects the characteristics of a defined population from which it is based. The most common characteristic reflected in mortality tables is sex, as men and women of the same age usually experience different mortality rates. In addition to sex, many other factors have been shown to affect mortality, including employment status, disability status, smoking, obesity, income level, self-reported health, industry of employment, and educational attainment. Some of these factors are within the individual's control, while others are not. Many longevity models incorporate multiple factors. For example, the two largest U.S. actuarial organizations support a model used to estimate the likelihood of reaching certain ages for an individual or a couple, based on age, sex, smoking status, and self-reported health.[18]

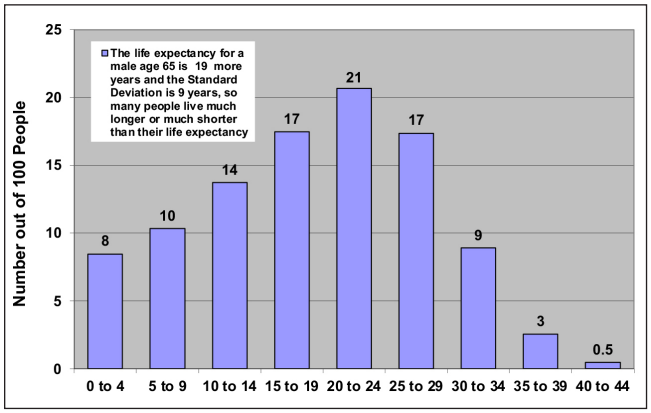
4. ***Life expectancy*** is the average number of years an individual or group of people is expected to live, calculated as the weighted average of the ages at death for a comparable group. It does not predict what an individual will necessarily experience, as very few people die at precisely the average age of death. It is a useful tool for comparing mortality tables using a single metric.

18 American Academy of Actuaries and Society of Actuaries, Actuaries Longevity Illustrator, www.longevityillustrator.org/.

- If age is not specified, it is usually understood to refer to life expectancy *at birth*.
    - Future expectations are often added to a person's current age to estimate their total life expectancy at that age. For example, if the future life expectancy at age 65 is 21, they would be expected to live until age 86 (65 plus 21).
    - Changes in mortality at younger ages have a disproportionately large effect on life expectancy, whereas changes at older ages usually have a limited impact. Therefore, life expectancy at ages other than birth may be more appropriate for certain uses.
    - The median age at death (the midpoint age at which 50% have died) and the modal age of death (the age at which the largest number of individuals are expected to die) are usually a few years later than their life expectancy, because the average (mean) is pulled down by deaths at very young ages.
    - Life expectancy at age 65 is often used to evaluate the expected value of a series of retirement benefits.

Life expectancy can serve as a valuable metric for **comparing mortality tables** or the longevity of two populations with different characteristics using a single statistic. Additionally, for those trying to gauge their expected longevity, using a range of ages around life expectancy can capture the ages at which they are most likely to die. For example, a range of life expectancy plus or minus seven years can capture the middle half of expected deaths in many modern mortality tables. Figure 16 illustrates the range of expected deaths relative to life expectancy at age 65.

Figure 16. Years Lived In Retirement For Someone Retiring at Age 65



Uses cohort population mortaility from the 2022 Trustees Report for someone born in 1959

5. ***Longevity***, the length of life measured at a given point in time or at a given age, can apply to an individual or a group. When applied to a group, it has essentially the same meaning as life expectancy and is often used interchangeably with that term.

6. ***Age-adjusted mortality rates*** compare mortality risks between populations by weighting each group's mortality rates using a standardized age distribution. This is helpful because crude death rates can be misleading when comparing groups with different age structures. It is also used to compare a single population over time to adjust for changes in the age composition of that population.

7. **Mortality ratios** compare the mortality rates of two groups. They may be computed either by dividing the mortality rate of one group by that of the other, or by dividing both rates by a standard rate, usually that of a larger group encompassing the two groups being compared. The ratios may be computed age by age, or a single age-adjusted rate may be used.

8. ***Period*** vs. ***Cohort.***[19] Period tables, or period life expectancies, are constructed using mortality rates from a specific period, typically a single year (i.e., they assume no future change in mortality rates). This approach can be used to determine period life expectancies that summarize the state of mortality in a population for a specific year and to compare it with that of another year. An example of this type of calculation is the U.S. Life Tables, published by the CDC's National Center for Health Statistics and the National Vital Statistics System. *Cohort* mortality reflects the rates that apply to individuals and others in the same birth cohort, including assumptions about how mortality rates will change over future periods. A cohort table reflects the mortality rates of a group over its lifetimes.

9. ***Mortality improvement*** refers to a decrease in mortality rates over time. Mortality tables are typically constructed under the assumption of a certain level of mortality improvement, which can vary over time or reflect multiple mortality characteristics. With some notable temporary exceptions, mortality rates at older ages have generally declined throughout the history of the Social Security program; therefore, the Social Security Trustees have assumed that mortality improvement will continue in the future. It is typically a gradual process, but it can also include volatility or occur suddenly for a short or long period.

19 See Academy issue brief, *Interpreting Pandemic-Related Decreases in Life Expectancy*.

10. ***Uncertainty***. Future life expectancy and mortality rates are subject to considerable uncertainty. For instance, the 2026 Social Security Trustees Report presents period life expectancy at birth and at age 65, disaggregated by sex, for both historical and projected years, under three sets of assumptions. These three sets provide a range of possible mortality trajectories. Future mortality improvement can be especially uncertain.

11. ***Healthy life expectancy*** is the average number of years a person can expect to live in good health. An increase in life expectancy does not necessarily mean that those living longer will be in good health. Healthy life expectancy may not increase at the same rate as life expectancy. Although healthy life expectancy is an important longevity metric with significant societal implications, life expectancy determines the period for which individuals receive Social Security benefits.



American Academy of Actuaries

1850 M STREET NW, SUITE 300, WASHINGTON, D.C. 20036

202-223-8196 | **ACTUARY.ORG**

© 2026 American Academy of Actuaries. All rights reserved.