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# Mortality Trends Among Working-Age Whites: The Untold Story

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**Abstract**   Recent research has called attention to an unexpected rise in death rates among middle-aged, white Americans between 1999 and 2014. The full extent of the phenomenon may be underappreciated, however. If one assumes, based on historical trends, that mortality rates should have declined by 1.8 percent per year, then whites in 2014 had higher-than-expected mortality rates from age 19 to age 65. Furthermore, while increased substance abuse and suicides explain the elevated mortality rates for younger adults, middle-aged whites also seem to be experiencing stalled or rising mortality rates for most ailments and diseases. While a national phenomenon, middle-aged whites face much more adverse mortality trends in certain states and regions. The especially broad reach of these negative mortality trends suggests there is an urgent need for further investigation of its causes and potential remedies.

## INTRODUCTION

At the end of 2015, Princeton University economists Anne Case and Angus Deaton published a startling finding: since 1999, death rates have been rising for non-Hispanic, white Americans between the ages of 45 and 54, reversing a decades-long decline.[1] The authors largely attribute this reversal to rising rates of drug poisonings, suicides, and alcohol-related liver disease. They also note that over the same period, middle-aged whites reported worsening self-reported health status, greater levels of pain, increased difficulty with activities of daily living, and more mental health problems.

In January 2016, the *New York Times* followed up on Case and Deaton's findings with an analysis showing that the rise in white mortality rates has not been confined to middle-aged adults but has occurred among younger adults—those 25 to 34—as well.[2] The main culprit: increasing abuse of prescription opioids, such as oxycodone and hydrocodone, and heroin.

These findings have attracted substantial attention. Upon further examination, however, it becomes clear that the gap between expected and actual white mortality rates is wider than commonly recognized. Moreover, the gap is not adequately explained for the middle-aged by the common narrative of rising levels of substance abuse and suicide. And while it is a national phenomenon, the mortality crisis has struck some regions of the United States much more severely than others.

## THE MORTALITY GAP

Between 1999 and 2014, mortality rates in the U.S. rose for white adults between the ages of 22 and 56, peaking at around age 30 and age 50 (Exhibit 1).[3] In contrast, mortality rates for both younger and older white Americans declined over this period.

Exhibit 1

## For Non-Hispanic Whites Ages 22 Through 56, Mortality Rates Were Higher in 2014 than in 1999

*Change in deaths per 100,000 people between 1999 and 2014*



Source: CDC WONDER Online Database.

However, this perspective fails to adequately account for the well-founded presumption that, absent a health crisis, mortality rates for white Americans should have been declining during this time. In other words, white Americans are now facing a substantial "mortality gap." Since 1968, death rates had declined by nearly 2 percent per year across most age groups as well as across races and ethnicities (Appendix Table 1).[4] Other high-income countries also have experienced this broad-based decline, which for many even appeared to accelerate between 1998 and 2013 (Appendix Table 2).

Relative to this baseline of improvement, the mortality gap for white Americans becomes much more pronounced (Exhibit 2).[5] It spans all the years of working life (ages 19–65) but is especially large at midlife. Compared with an expected decline of 1.8 percent annually, observed mortality rates in 2014 resulted in more than 100 excess deaths for every 100,000 middle-aged white adults.

Exhibit 2

## The "Mortality Gap" for Whites Spanned All Working-Age Years, But Was Most Severe at Middle Age

*Change in deaths per 100,000 people between 1999 and 2014*



● Expected change in non-Hispanic whites' mortality rate
assuming 1.8% annual decline

● Actual change in non-Hispanic whites' mortality rate

▌ Gap between the actual and expected change in the mortality rate

Age 18  Age 21  Age 24  Age 27  Age 30  Age 33  Age 36  Age 39  Age 42  Age 45  Age 48  Age 51  Age 54  Age 57  Age 60  Age 63
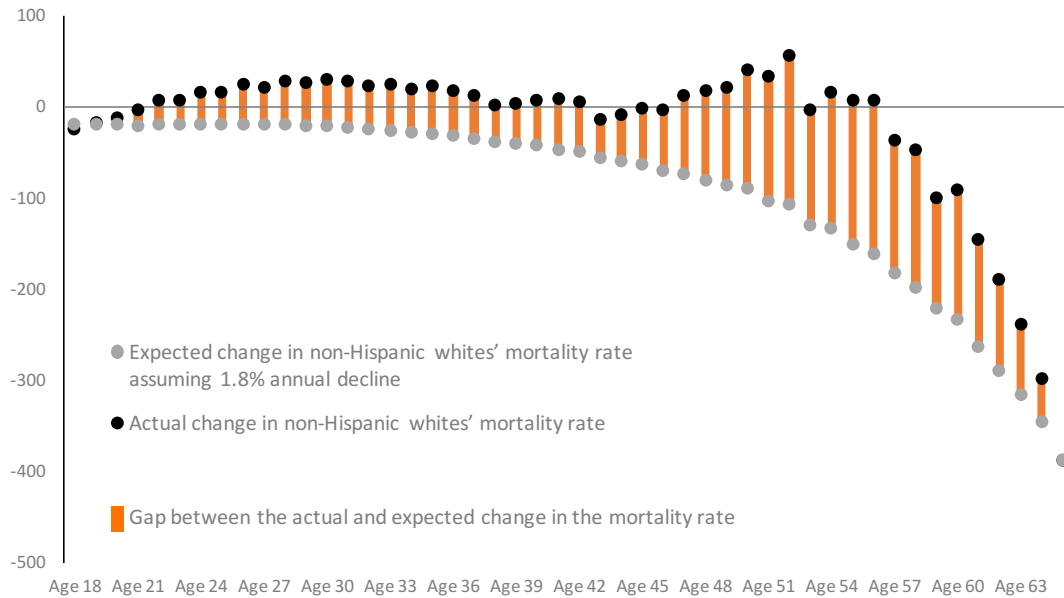
Source: CDC WONDER Online Database.

## THE CAUSES

Case and Deaton conclude that three causes of death account for the increase in midlife white mortality: accidental poisonings (mostly drug overdoses), suicides, and chronic liver diseases and cirrhosis associated with alcohol consumption. These three factors have risen in tandem, killing twice as many working-age whites in 2014 as in 1999.[6]

But as important as they are in explaining the mortality gap experienced by younger white adults, substance abuse, suicides, and liver disease do not fully explain why mortality rates for middle-aged white adults have *failed to decline as expected* (Exhibit 3). Upon further digging, we find a multifaceted phenomenon, where mortality rates for middle-aged whites have stopped declining—or actually increased—across a broad range of health conditions, including most of the leading causes of death for this group (Exhibit 4).

Heart disease, the second-leading cause of death for middle-aged whites in the United States, is illustrative. After rapidly declining between 1968 and 1998,[7] mortality from heart disease essentially leveled off for this population between 1999 and 2014. (For blacks and Hispanics, heart disease death rates continued their rapid decline.) This leveling-off in improvement was as important as the

Exhibit 3

## The "Mortality Gap" for Middle-Aged Whites Persists After Excluding Poisoning, Suicide, and Liver Disease

*Change in deaths per 100,000 people between 1999 and 2014*



● Expected change in non-Hispanic whites' mortality rate assuming 1.8% annual decline, excluding poisonings, suicides and liver disease

● Actual change in non-Hispanic whites' mortality rate excluding poisonings, suicides and liver disease

▮ Gap between the actual and expected change in the mortality rate
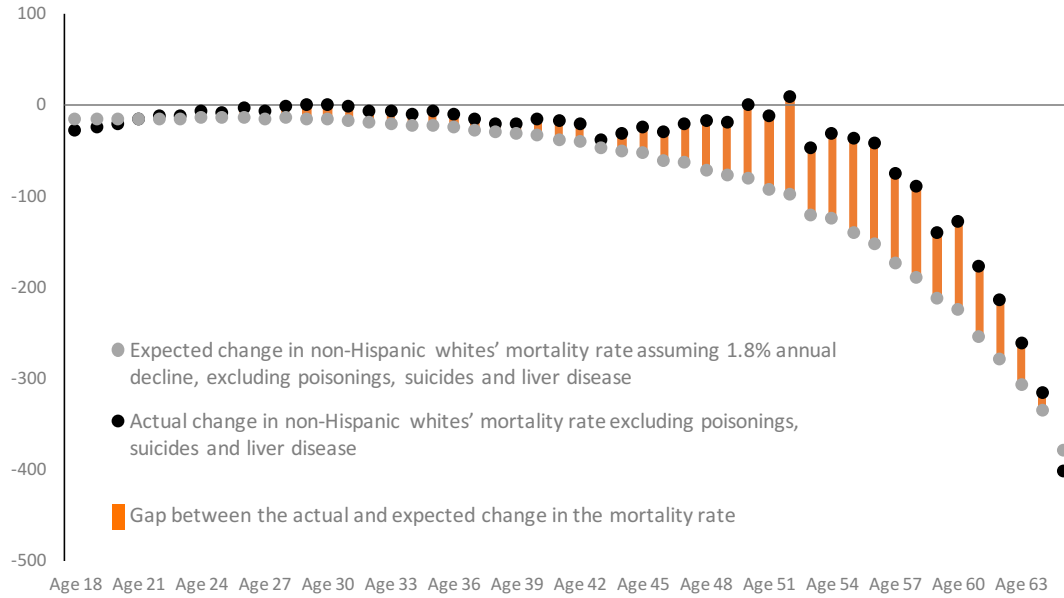
Source: CDC WONDER Online Database.

Exhibit 4

## Improvements in Mortality Rates Have Stalled or Reversed for the 10 Leading Causes of Death for Middle-Aged Whites

*Cause of death (2014 mortality rate)*                 *Change in mortality rate for white Americans, age 45-54*



Neoplasms (109.3)
Diseases of heart (80.2)
Poisonings (32.2)
Suicide (26.3)
Chronic liver disease and cirrhosis (21.2)
Motor vehicle accidents (12.8)
Diabetes mellitus (12.4)
Cerebrovascular diseases (10.1)
Chronic lower respiratory diseases (12.2)
Viral hepatitis (4.2)
All other causes (96.9)

■ 1968-1983
■ 1983-1998
■ 1999-2014

*Lower mortality* ←          → *Higher mortality*
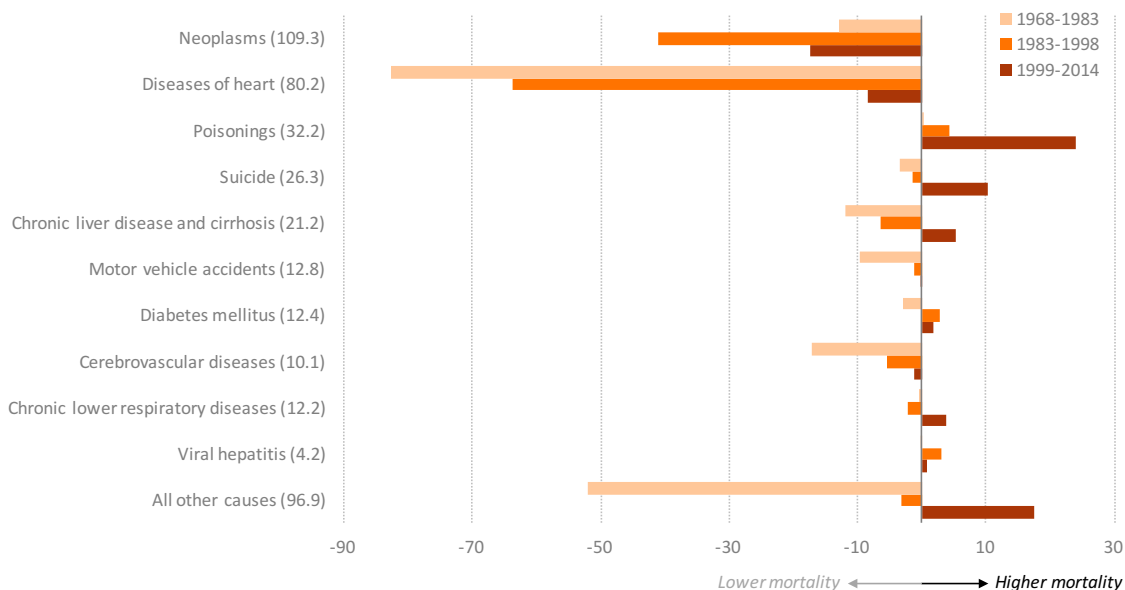
Note: Data between 1968 and 1998 for all whites; data between 1999 and 2014 for non-Hispanic whites. Mortality rate is deaths per 100,000 people.
Source: CDC WONDER Online Database.

rise in drug overdoses in explaining the gap between observed and expected mortality among middle-aged whites.[8]

The breadth of the mortality gap for middle-aged whites may reflect broad societal influences that at this point are unexplained. One hypothesis is that the excess deaths among middle-aged whites reflect erosion in their socioeconomic standing. On a range of social and economic indicators, middle-aged whites have been falling behind in the 21st century (Exhibit 5). For example, they have lower incomes, fewer are employed, and fewer are married. (Until 2014, they were also increasingly without health insurance, though that trend reversed with the Affordable Care Act's coverage expansions.) As further evidence of a socioeconomic link, Case and Deaton find that the mortality gap is concentrated among whites lacking a four-year college degree.[9]

**Exhibit 5. Fewer Non-Hispanic Whites, Ages 45–54, Are Married or Employed in 2014, Compared with 2002**

| | Without health insurance | Employed | Married | Income (% of federal poverty level) | | | Education | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | <200% | 200%–<400% | 400%+ | High school or less | Some college | College degree or more |
| 2002 | 11.3% | 79.9% | 72.0% | 16.0% | 26.3% | 57.8% | 40.7% | 27.8% | 31.4% |
| 2014 | 11.5%* | 77.0% | 67.8% | 22.1% | 27.5% | 50.4% | 40.2% | 26.4% | 33.5% |

* In 2013, 15.3% of this population was without health insurance. The decline in 2014 reflects the coverage expansions of the Affordable Care Act.
Source: Current Population Survey.

## REGIONAL VARIATION

The midlife mortality phenomenon has been especially severe in certain regions of the country (Exhibit 6; Appendix Table 3).[10] In seven southern states—West Virginia, Mississippi, Oklahoma, Tennessee, Kentucky, Alabama, and Arkansas—the gap between actual and expected mortality in 2014 exceeded 200 deaths per 100,000 people. In West Virginia, mortality rates were higher than at any time since 1980. In contrast, mortality rates for middle-aged whites improved slightly in several states, mostly in the Northeast, though not to the degree that would be expected from a historical annual improvement rate of 1.8 percent. No single disease or condition was responsible for the divergence between states with the worst mortality trends and the best mortality trends. Rather, the divergence occurred across all leading causes of death (data not shown).

Exhibit 6

## The "Mortality Gap" for Middle-Aged Whites Was Particularly Large in Parts of the South
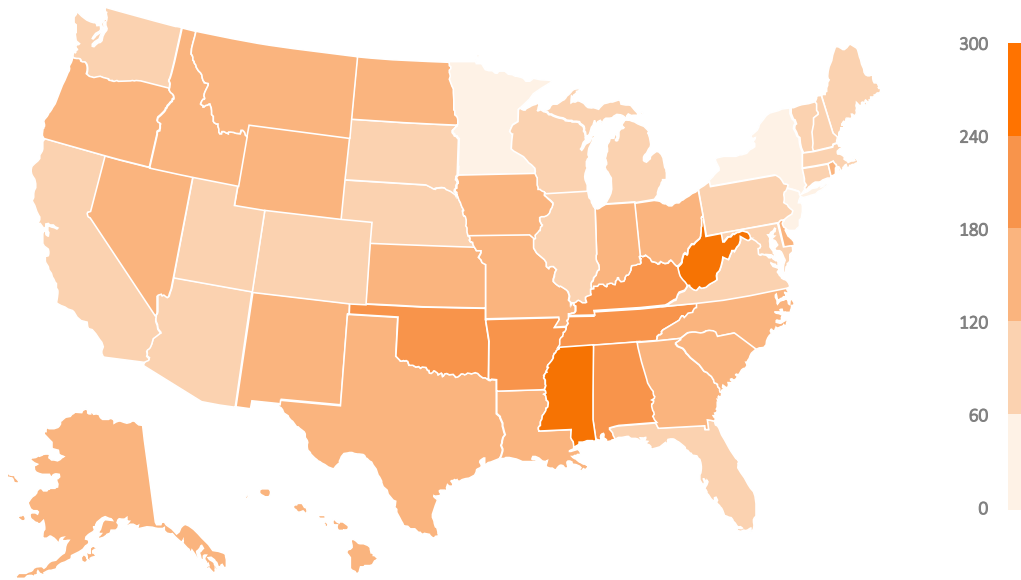


Note: The mortality gap compares states' actual mortality rate for non-Hispanic, middle-aged whites in 2013/2014 with what that rate would have been if it had declined by 1.8% per year since 1999/2000.
Source: CDC WONDER Online Database.

## DISCUSSION

We are accustomed as a nation to making steady progress in the area of health. Even when looking at death rates over the past 15 years, there is still plenty of support for that optimism. Mortality has continued to decline at relatively rapid rates for many age groups, both in white and minority populations (though this progress has not eliminated racial disparities).[11] But for working-age whites—especially 45-to-54-year-olds—we are witnessing regression that has little precedent in the industrialized world over the past half-century.

There are undoubtedly valuable public health lessons to be gained from these data. The role played by drug poisonings, suicide, and alcohol makes it extremely urgent to address these problems for all age groups and in all states. Yet they alone do not fully explain the mortality gap for middle-aged whites.

The notion that changing social and economic forces are a possible explanation does not mean that white middle-aged adults are suddenly worse off than other groups, especially minorities. Rather, it suggests that their lives have changed in unexpected ways in recent years. Social commentators of different political leanings have documented these changes and ascribed many to the same underlying causes: less-educated workers' increasing disengagement from the mainstream economy; declining levels of social connectedness; weakened communal institutions; and the splintering of society along class, geographic, and cultural lines.[12]

These findings also increase concern over continuing lack of health insurance, particularly given that a number of the states with the worst mortality trends have failed to expand their Medicaid program to all low-income adults. Still, considering the scope of the mortality gap, it is unlikely to be closed through insurance expansion alone. Working-age, non-Hispanic whites make up 39 percent of the U.S. population. Reversing their current mortality trend should be an urgent priority, as should reducing other health disparities associated with race and income.

## Limitations of This Analysis

This brief draws primarily from data on Underlying Cause of Death from the CDC WONDER Online Database (http://wonder.cdc.gov). A number of limitations related to the comparability and definitions of data over time should be noted. In general, the data refer to non-Hispanic whites. But for periods prior to 1999, the data presented in Exhibit 4 and Appendix Table 1 pertain to all whites. Causes of death were recorded using different classifications in those earlier years, but this did not appear to influence the mortality trends presented in Exhibit 4. Deaths as a result of drug overdose or suicide may be underreported. Finally, where age groups span multiple years, non-age-adjusted figures are presented. However, age adjustment, where possible, did not materially affect the results.

## Notes

[1]   A. Case and A. Deaton, "Rising Morbidity and Mortality in Midlife Among White Non-Hispanic Americans in the 21st Century," *Proceedings of the National Academy of Sciences of the United States of America,* Dec. 8, 2015 112(49):15078–83.

[2]   G. Kolata and S. Cohen, "Drug Overdoes Propel Rise in Mortality Rates of Young Whites," *New York Times,* Jan. 16, 2016.

[3]   The exceptions were non-Hispanic whites ages 43 to 46. This appears to reflect a comparably healthy cohort of Americans born around 1970, rather than a different trend at those particular ages.

[4]   A. Case and A. Deaton, "Rising Morbidity and Mortality in Midlife Among White Non-Hispanic Americans in the 21st Century," *Proceedings of the National Academy of Sciences of the United States of America,* Dec. 8, 2015 112(49):15078–83.

[5]   The baseline assumption of 1.8 percent annual improvement matches the trend for U.S. whites ages 45 to 54 from 1983 to 1998. It also approximates the rate of improvement for Hispanic and black Americans between 1999 and 2014.

[6]   Mortality as a result of these three causes for working-age non-Hispanic whites grew to 63.1 per 100,000 population in 2014 from 32.2 per 100,000 population in 1999.

[7]   In 1999, the diagnosis codes recorded in the CDC's mortality database shifted from ICD-9 to ICD-10. Consequently, we compare trends for 1983 to 1998 and those for 1999 to 2014 to avoid any one-time shifts that this change may have introduced between 1998 and 1999.

[8]  Among the 10 most common causes of death, cancer was something of an exception, with rates declining by 14 percent between 1999 and 2014. While meaningful, this was still less of a decline than occurred between 1983 and 1998, when cancer deaths fell by 25 percent. Much, though not all, of this slowdown appears to be the result of historic changes in smoking patterns. The impact of smoking trends on whites' overall mortality gap is difficult to parse but appears not to be a driving factor. Smoking trends do, however, appear to explain why middle-aged white women had worse mortality trends than middle-aged white men between 1999 and 2014, as lung cancer deaths declined considerably faster for men than women during this period (data not shown).

[9]  A. Case and A. Deaton, "Rising Morbidity and Mortality in Midlife Among White Non-Hispanic Americans in the 21st Century," *Proceedings of the National Academy of Sciences of the United States of America,* Dec. 8, 2015 112(49):15078–83.

[10]  Notably, between 1983 and 1998, states with high baseline mortality rates for middle-aged whites improved more quickly than states with low mortality rates. Between 1999 and 2014, this trend toward convergence reversed, and the states with high baseline mortality regressed more quickly.

[11]  K. D. Kochanek, E. Arias, and R. N. Anderson, *Leading Causes of Death Contributing to Decrease in Life Expectancy Gap Between Black and White Populations: United States, 1999–2013,* NCHS Data Brief No. 218 (Hyattsville, Md.: National Center for Health Statistics, Centers for Disease Control and Prevention, Nov. 2015).

[12]  G. Packer, *The Unwinding: An Inner History of the New America* (New York: Farrar, Straus and Giroux, 2013); and C. Murray, *Coming Apart: The State of White America, 1960–2010* (New York: Crown Forum, 2012).

## Appendix Table 1. Average Annual Change in the All-Cause Mortality Rate in the United States, by Race/Ethnicity, Age, and Time Period

|  | Ages 25–34 | Ages 35–44 | Ages 45–54 | Ages 55–64 | Ages 65–74 |
|---|---|---|---|---|---|
| **U.S. White** |  |  |  |  |  |
| 1968–83 | –1.2% | –2.7% | –2.2% | –1.7% | –1.7% |
| 1983–98 | –1.1%* | –0.1%* | –1.8% | –1.7% | –1.0% |
| 1999–2014 (non-Hispanic) | 1.6% | 0.3% | 0.6% | –0.7% | –2.0% |
| **U.S. Black** |  |  |  |  |  |
| 1968–83 | –3.5% | –3.8% | –2.6% | –1.8% | –1.7% |
| 1983–98 | –1.0%* | –0.7%* | –1.3% | –1.5% | –0.8% |
| 1999–2014 (non-Hispanic) | –1.3% | –2.4% | –2.1% | –1.7% | –2.3% |
| **U.S. Hispanic** |  |  |  |  |  |
| 1999–2014 | –1.0% | –2.1% | –1.5% | –1.4% | –2.3% |

\* The slow rate of improvement for adults ages 25–44 between 1983 and 1998 partly reflects the HIV/AIDS epidemic, which elevated mortality rates considerably during the early and mid-1990s, though had mostly waned by 1998.
Source: CDC WONDER Online Database.

**Appendix Table 2. Average Annual Change in the All-Cause Mortality Rate by Age and Time Period in Other Countries**

| | Ages 25–29 | Ages 30–34 | Ages 35–39 | Ages 40–44 | Ages 45–49 | Ages 50–54 | Ages 55–59 | Ages 60–64 | Ages 65–69 | Ages 70–74 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Australia** | | | | | | | | | | |
| 1968-83 | -1.0% | -2.5% | -3.5% | -3.4% | -3.0% | -2.5% | -2.3% | -2.6% | -2.4% | -2.3% |
| 1983-98 | -0.1% | 0.7% | 0.0% | -1.4% | -2.6% | -3.4% | -3.4% | -2.9% | -2.6% | -2.1% |
| 1998-11 | -4.4% | -3.0% | -2.0% | -1.5% | -0.9% | -1.5% | -2.0% | -2.6% | -3.2% | -3.0% |
| **Canada** | | | | | | | | | | |
| 1968-83 | -1.6% | -1.7% | -2.5% | -2.1% | -2.2% | -1.7% | -1.7% | -1.7% | -1.5% | -1.3% |
| 1983-98 | -1.7% | -1.3% | -0.9% | -1.6% | -2.0% | -2.6% | -2.3% | -1.9% | -1.7% | -1.4% |
| 1998-11 | -1.6% | -1.9% | -2.4% | -2.0% | -1.5% | -1.5% | -1.9% | -2.3% | -2.7% | -2.7% |
| **France** | | | | | | | | | | |
| 1968-83 | -0.3% | -0.9% | -1.5% | -1.6% | -1.1% | -0.9% | -1.3% | -1.9% | -1.9% | -1.8% |
| 1983-98 | -2.1% | -1.6% | -1.2% | -1.1% | -1.5% | -2.2% | -2.2% | -1.8% | -2.1% | -2.1% |
| 1998-13 | -3.3% | -3.1% | -3.1% | -2.8% | -2.3% | -1.5% | -1.0% | -1.5% | -2.1% | -2.4% |
| **Germany** | | | | | | | | | | |
| 1990-98 | -3.6% | -4.4% | -3.4% | -1.3% | -2.0% | -2.1% | -2.9% | -2.6% | -1.5% | -2.0% |
| 1998-11 | -2.8% | -2.5% | -3.5% | -3.6% | -2.7% | -1.6% | -1.4% | -1.7% | -2.5% | -2.6% |
| **Japan** | | | | | | | | | | |
| 1968-83 | -3.9% | -3.7% | -3.6% | -2.9% | -2.0% | -2.0% | -2.9% | -3.6% | -3.5% | -3.3% |
| 1983-98 | -1.4% | -1.4% | -1.6% | -1.7% | -1.7% | -1.8% | -1.7% | -1.2% | -1.5% | -2.3% |
| 1998-12 | -0.9% | -1.6% | -1.6% | -1.6% | -2.1% | -2.0% | -1.7% | -1.7% | -2.1% | -2.1% |
| **Netherlands** | | | | | | | | | | |
| 1968-83 | -1.5% | -1.5% | -1.9% | -1.7% | -1.3% | -1.1% | -1.0% | -1.1% | -1.0% | -1.1% |
| 1983-98 | -0.8% | -1.1% | -1.1% | -0.5% | -1.0% | -1.3% | -1.7% | -1.1% | -1.0% | -1.0% |
| 1998-12 | -3.2% | -1.8% | -2.4% | -2.9% | -2.3% | -2.0% | -1.5% | -2.3% | -2.8% | -2.7% |
| **New Zealand** | | | | | | | | | | |
| 1968-83 | -0.8% | -1.6% | -2.3% | -1.5% | -1.6% | -1.6% | -1.2% | -1.3% | -1.2% | -1.2% |
| 1983-98 | -0.1% | -0.6% | -1.1% | -1.6% | -3.3% | -3.0% | -2.8% | -2.5% | -2.6% | -2.7% |
| 1998-08 | -3.5% | -3.4% | -1.0% | -2.3% | -2.0% | -2.4% | -2.4% | -3.4% | -3.1% | -2.4% |
| **Norway** | | | | | | | | | | |
| 1968-83 | -0.2% | -1.0% | -1.6% | -1.9% | -0.9% | -0.1% | -0.4% | -0.8% | -1.1% | -1.1% |
| 1983-98 | -0.1% | 0.3% | 0.0% | -0.4% | -1.9% | -1.8% | -2.1% | -1.7% | -1.6% | -1.5% |
| 1998-13 | -2.5% | -2.8% | -2.5% | -2.7% | -2.5% | -2.7% | -1.7% | -2.2% | -2.1% | -2.5% |
| **Sweden** | | | | | | | | | | |
| 1968-83 | -0.9% | -2.1% | -2.0% | -0.6% | -1.1% | -0.3% | -1.0% | -0.8% | -1.0% | -1.4% |
| 1983-98 | -3.7% | -2.6% | -1.6% | -2.3% | -2.2% | -2.4% | -1.9% | -1.7% | -1.8% | -1.8% |
| 1998-13 | 1.4% | -0.8% | -2.2% | -2.7% | -2.2% | -1.9% | -2.0% | -2.0% | -2.0% | -2.1% |
| **Switzerland** | | | | | | | | | | |
| 1968-83 | 0.3% | -0.9% | -1.3% | -1.5% | -1.8% | -1.9% | -2.0% | -1.7% | -1.9% | -2.0% |
| 1983-98 | -2.0% | -0.1% | -2.0% | -0.9% | -1.8% | -1.8% | -2.0% | -2.2% | -2.5% | -2.2% |
| 1998-11 | -5.0% | -4.5% | -3.3% | -3.7% | -2.3% | -2.6% | -2.6% | -2.3% | -1.9% | -2.7% |
| **United Kingdom** | | | | | | | | | | |
| 1968-83 | -0.8% | -1.2% | -1.7% | -2.0% | -1.5% | -1.4% | -0.9% | -1.0% | -1.0% | -1.1% |
| 1983-98 | 0.4% | 0.2% | -0.4% | -1.0% | -1.9% | -2.4% | -2.6% | -2.5% | -2.1% | -1.5% |
| 1998-13 | -2.6% | -1.4% | -0.8% | -1.0% | -1.5% | -1.9% | -2.2% | -2.5% | -3.1% | -3.2% |
| **International Average** | | | | | | | | | | |
| 1968-83 | -1.3% | -2.0% | -2.3% | -1.9% | -1.7% | -1.4% | -1.6% | -1.8% | -1.6% | -1.7% |
| 1983-98 | -1.3% | -0.9% | -1.2% | -1.5% | -2.1% | -2.2% | -2.2% | -1.9% | -2.0% | -1.9% |
| 1998-13 | -2.6% | -2.4% | -2.1% | -2.3% | -2.0% | -2.0% | -1.9% | -2.3% | -2.5% | -2.6% |

Source: The Human Mortality Database, http://www.mortality.org/.

**Appendix Table 3. Change in All-Cause Mortality Rates for Non-Hispanic Whites, Ages 45–54, by State**

| State | All-cause mortality rate (deaths per 100,000 pop.) | | Change between 1999–2000 and 2013–2014 | | Mortality gap: difference between actual and expected 2013–2014 mortality rate (expecting 1.8% annual decline since 1999–2000) | |
| --- | --- | --- | --- | --- | --- | --- |
| | 1999–2000 | 2013–2014 | Deaths per 100,000 pop. | Percent | Deaths per 100,000 pop. | Percent |
| New York | 351 | 321 | -30 | -8% | 49 | 18% |
| New Jersey | 365 | 340 | -25 | -7% | 57 | 20% |
| California | 398 | 375 | -23 | -6% | 66 | 21% |
| Connecticut | 329 | 315 | -14 | -4% | 60 | 23% |
| Minnesota | 290 | 284 | -6 | -2% | 59 | 26% |
| Massachusetts | 338 | 333 | -5 | -1% | 71 | 27% |
| Illinois | 362 | 361 | -2 | 0% | 80 | 28% |
| Vermont | 335 | 337 | 2 | 1% | 78 | 30% |
| Wisconsin | 324 | 327 | 3 | 1% | 76 | 30% |
| Arizona | 428 | 434 | 6 | 1% | 102 | 31% |
| Maryland | 360 | 367 | 7 | 2% | 88 | 32% |
| Pennsylvania | 375 | 384 | 9 | 3% | 94 | 32% |
| Florida | 473 | 484 | 11 | 2% | 117 | 32% |
| New Hampshire | 318 | 334 | 17 | 5% | 88 | 36% |
| Nevada | 513 | 534 | 21 | 4% | 136 | 34% |
| Washington | 339 | 362 | 23 | 7% | 99 | 38% |
| Colorado | 307 | 331 | 23 | 8% | 92 | 39% |
| Michigan | 370 | 399 | 29 | 8% | 112 | 39% |
| Maine | 348 | 379 | 30 | 9% | 109 | 40% |
| Virginia | 343 | 374 | 31 | 9% | 108 | 41% |
| South Dakota | 314 | 347 | 33 | 10% | 103 | 42% |
| Utah | 329 | 363 | 34 | 10% | 107 | 42% |
| North Carolina | 399 | 436 | 37 | 9% | 127 | 41% |
| Texas | 408 | 446 | 38 | 9% | 130 | 41% |
| Oregon | 370 | 409 | 39 | 11% | 122 | 43% |
| Nebraska | 314 | 362 | 48 | 15% | 119 | 49% |
| Georgia | 417 | 465 | 49 | 12% | 142 | 44% |
| Montana | 329 | 379 | 50 | 15% | 124 | 49% |
| Delaware | 382 | 436 | 53 | 14% | 139 | 47% |
| Idaho | 327 | 383 | 56 | 17% | 130 | 51% |
| Indiana | 407 | 464 | 56 | 14% | 148 | 47% |
| Alaska | 324 | 386 | 61 | 19% | 134 | 53% |
| Missouri | 407 | 468 | 61 | 15% | 153 | 48% |
| North Dakota | 284 | 346 | 62 | 22% | 126 | 57% |
| Iowa | 323 | 387 | 64 | 20% | 136 | 54% |
| Ohio | 387 | 453 | 66 | 17% | 153 | 51% |
| South Carolina | 449 | 515 | 66 | 15% | 167 | 48% |
| Rhode Island | 346 | 413 | 67 | 19% | 145 | 54% |
| Wyoming | 363 | 437 | 74 | 20% | 155 | 55% |
| Kansas | 347 | 424 | 77 | 22% | 155 | 58% |
| Louisiana | 443 | 521 | 78 | 18% | 177 | 52% |
| New Mexico | 380 | 466 | 85 | 22% | 171 | 58% |
| Hawaii | 329 | 431 | 102 | 31% | 176 | 69% |
| Arkansas | 470 | 582 | 112 | 24% | 218 | 60% |
| Alabama | 468 | 584 | 116 | 25% | 221 | 61% |
| Kentucky | 461 | 580 | 119 | 26% | 223 | 62% |
| Tennessee | 456 | 576 | 119 | 26% | 222 | 63% |
| Oklahoma | 480 | 603 | 124 | 26% | 231 | 62% |
| Mississippi | 471 | 624 | 152 | 32% | 258 | 71% |
| West Virginia | 460 | 629 | 169 | 37% | 273 | 76% |

Source: CDC WONDER Online Database.

## About the Authors

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