

# The Role of Geographic Disparities in High and Rising Mortality Rates Among U.S. Working-Age Adults

**F**or most of the past century, life expectancy increased in the United States and in other high-income countries. In 2010, however, progress in life expectancy in the United States began to stall despite continuing to increase in other peer countries. Alarmingly, U.S. life expectancy fell for 3 years in a row from 2015 to 2017, the longest sustained decline in a century since the influenza pandemic of 1918–1919. Already ranked relatively low in life expectancy among other high-income countries, the United States has continued to lose ground. The stalling and subsequent decline in life expectancy during the 2010s appears to be due to an increase in mortality among “working-age” adults, those between 25–64 years of age.

To understand the key drivers of increasing working-age mortality and the widening health inequalities that accompany it, the National Academies of Sciences, Engineering, and Medicine convened a committee of experts to investigate these trends. The committee’s report, *High and Rising Mortality Rates Among Working-Age Adults* (2021), identifies three categories of causes of death as the predominant drivers of trends in working-age (ages 25–64) mortality: drug poisonings and alcohol-induced causes, suicide, and cardiometabolic diseases. The report also examines the complex relationship between health and place in these mortality trends and makes recommendations for future research and data collection to reduce the rates of and disparities in mortality in this age group. Below is an overview of the report’s findings regarding geographic disparities in working-age mortality trends.

## THE ROLE OF GEOGRAPHIC DISPARITIES IN WORKING-AGE MORTALITY

The period between 1990 and 2017 was defined by large and growing geographic disparities in working-age mortality, particularly between large central metropolitan and less populated areas. Large central metropolitan<sup>1</sup> areas (“metropolitan areas” are hereafter referred to as “metros”) experienced the most favorable trends—either the largest declines or the smallest increases in mortality—while nonmetropolitan areas (hereafter referred to as “nonmetros”) experienced the largest increases in mortality. These trends marked a reversal from the early 1990s, when large central metros experienced the highest working-age mortality; by the mid-2010s working-age mortality in these areas was lower than in less populated areas. There was, however, variation in these trends by

<sup>1</sup>In this report, counties are classified into four groups: (1) large central metropolitan areas (counties in metropolitan statistical areas [MSAs] of more than 10 million population, including counties that contain all or part of the area’s inner cities, referred to as “large central metros”); (2) large fringe metropolitan areas (surrounding counties of the large central metros, referred to as “large fringe metros”), corresponding to suburbs; (3) small and medium metropolitan areas (counties in MSAs of 50,000–999,999 population, referred to as “small/medium metros”); and (4) nonmetropolitan areas (counties outside of metropolitan areas, referred to as “nonmetros”), corresponding to rural areas.

age, gender, race and ethnicity, and time period. The mortality declines in large central metros were especially pronounced among non-Hispanic (NH) White (White) adults, but also occurred among Hispanic and NH Black (Black) adults.

Mortality trends also varied substantially across regions and states. The Northeast and West exhibited comparatively large declines in mortality rates among both males and females. The U.S. states that experienced both the most favorable and the least favorable changes in mortality between 1990 and 2017 were in the South, though they consistently had the highest mortality rates throughout the period. Some of the largest declines in mortality occurred in states along the Southeastern Seaboard, including the District of Columbia, Florida, Georgia, Maryland, North Carolina, and Virginia, as well as Texas. Conversely, Alabama, Arkansas, Kentucky, Mississippi, Oklahoma, Tennessee, and West Virginia, had the most unfavorable mortality trends. Metropolitan status differences were also evident in these trends—the largest and most consistent improvements in mortality among working-age adults occurred in states with large populations anchored by large central metros, such as California, Illinois, New Jersey, and New York.

County-level mortality disparities within states were often as striking as those between states. Mortality rates increased within several geographic regions that crossed state borders, particularly for younger working-age adults (25–44), and most significantly in central Appalachia, New England, the central United States, and parts of the Southwest and Mountain West. There were also notable differences in the county-level mortality trends by sex and age. Increases in working-age mortality among females were particularly striking—particularly among those ages 25–44—and were widespread throughout the United States. In contrast, older working-age males (45–64) experienced declines in mortality across much of the country, driven largely by mortality declines among NH Blacks.

In the early 1990s, almost none of the large central metro counties had mortality rates that fell in the lowest quintile; however, these counties were the most likely to have mortality rates in the highest quintile. By 2015–2017, large central metro counties were most likely to have the lowest mortality rates (and least likely to have high mortality rates), while nonmetro counties were most likely to have the highest mortality rates in the country.

### **Geographic Disparities in Mortality Due to Specific Causes of Death**

Metro status differences in cause-specific mortality rates followed similar trends to those for all-cause mortality, suggesting that the growing mortality gap between large central metros and less population areas was the cumulative result of underlying processes that affected multiple causes of death. In general, when cause-specific mortality rates decreased over the period, they declined the most in large central metros; when they increased, the increases were smaller in large central metros.

This pattern was most consistent for working-age NH Whites, among whom those living outside of large central metros experienced larger increases in mortality across a broader range of causes of death, with the largest increases generally occurring within nonmetropolitan counties. Although NH Black and Hispanic adults in large central metros also experienced larger declines in mortality from many causes of death than those in less populated areas, those in nonmetros often experienced larger decreases for the causes of death that were key drivers of reductions in mortality over the period, such as

cancers other than lung and liver cancer or ischemic heart disease and other circulatory diseases. However, Black and Hispanic adults in large central metros, particularly males, saw much larger declines in mortality from HIV/AIDS and homicides during the period that offset these differences and drove the greater overall improvements in all-cause mortality in large central metros.

The increase in drug poisoning mortality was the most notable exception to the pattern of more favorable mortality trends within large metro areas. Among White males and older (ages 45–64) NH Black males and females, large central and fringe metros saw the largest increases in mortality from drug poisoning, while nonmetros experienced smaller (though still robust) increases. Drug poisonings increased over the study period across all demographic groups in all metro status categories. Among NH White males, the largest increases occurred in large fringe metros, while among older Black adults, the largest increases occurred in large central metros. Thus, drug poisoning mortality did not contribute to, and in fact offset, the growing mortality disparity between large central metros and less populated areas among White males and older (ages 45–64) Black males and females. Similarly, changes in alcohol-related mortality largely unfolded in parallel across metropolitan and nonmetropolitan areas, which meant that increases in alcohol-related mortality did not meaningfully contribute to the growing mortality gap between large central metros and less-populated areas.

Working-age drug poisoning mortality rates increased for both males and females in all states from 1990 to 2017, but the increases were most pronounced in West Virginia (more than 2000% for both males and females). By the end of the period, the areas with the highest drug poisoning mortality included Appalachia, New England, Florida, Eastern Oklahoma, and the desert Southwest. In state- and county-level analyses, prescription opioids, heroin, and fentanyl have been found to be differentially implicated in overdoses across different parts of the United States. For example, synthetic opioid deaths have been strongly concentrated throughout the East, whereas heroin overdoses have been highest in the industrial Midwest and New Mexico.

The trends in other major trend-driving causes of death followed different geographic patterns. Alcohol-related deaths increased most in the West, especially Alaska, Arizona, Montana, New Mexico, North Dakota, Oklahoma, South Dakota, and Wyoming. Suicides increased most consistently across the Midwest, with large increases in North and South Dakota. There were also pronounced increases in certain Western states (Arkansas, Montana, and Wyoming) and in the South (Arkansas, Oklahoma, and West Virginia). Mortality from both hypertensive heart disease and endocrine, nutrition, and metabolic (ENM) diseases increased the most in the South (Arkansas, Kentucky, Mississippi, Oklahoma, and for ENM diseases, West Virginia).

## RECOMMENDATIONS

The committee developed several research recommendations designed to improve understanding of factors driving working-age mortality, including related to geographic disparities. Three such recommendations include

**RECOMMENDATION 5-4:** To enable robust research on rural–urban trends in health and mortality, the National Institutes of Health and other research agencies and funders should support the oversampling of rural populations on national health and social sur-

veys, including both existing (e.g., Health and Retirement Study, Behavioral Risk Factor Surveillance System, National Longitudinal Study of Adolescent to Adult Health [Add Health], National Survey on Drug Use and Health, National Health Interview Survey, National Health and Nutrition Examination Survey) and new surveys.

**RECOMMENDATION 7-4:** The Substance Abuse and Mental Health Services Administration should add to the publicly accessible version of the National Survey on Drug Use and Health U.S. Census region or Census division categories and the nine-category U.S. Department of Agriculture Economic Research Service rural–urban continuum codes or National Center for Health Statistics urban influence codes.

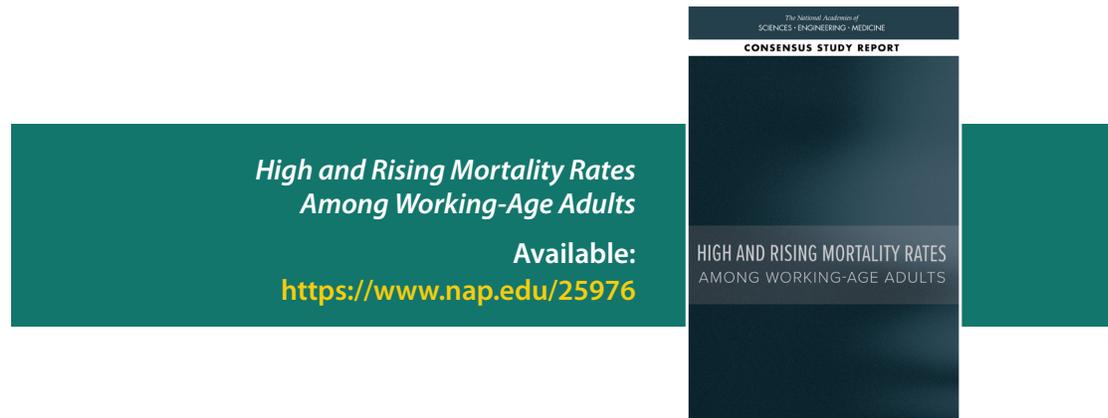
**RECOMMENDATION 11-4:** The National Institutes of Health and other government and private research funders invested in understanding the structural and policy determinants of health should support a robust research program aimed at identifying the macro-level historical and contemporary drivers (e.g., social, economic, cultural, policy) of health and mortality inequities and the mediators (e.g., environmental, socioeconomic, health care, biological, psychological, behavioral) through which these drivers operate to create and sustain persistent racial/ethnic, socioeconomic (income and education), and geographic (including rural–urban, regional, and across- and within-state) disparities in U.S. working-age mortality. Particular emphasis should be on understanding policy solutions that may be effective in reducing and eliminating inequities in health and well-being.

**RECOMMENDATION 11-6:** Federal agencies, in partnership with private foundations and other funding entities, should support quantitative and qualitative interdisciplinary research on how factors defined at multiple levels (e.g., nation, state, community, family, individual) relate to working-age mortality, especially to deaths involving drug and alcohol use, suicide, and cardiometabolic disease.

- This research should examine how mortality due to drugs and alcohol, suicide, and cardiometabolic disease varies by individual-level demographic characteristics (including sex, race and ethnicity, and socioeconomic status), economic and social factors (e.g., social integration, unemployment, income inequality, public policy), and various levels of geographic characteristics that may change over time (e.g., geographic characteristics of counties, state and local jurisdictions, labor markets, and neighborhood environments).
- The research should explore how mortality is affected by long-term changes in the economy (e.g., changes in employment, employment opportunities, and job characteristics), especially in certain geographic areas; by interaction between economic factors and such social factors as family structure, community support, and religiosity; by the duration of economic hardship; and by programs designed to alleviate economic deprivation and other social stressors.
- The research should consider study designs, measurement strategies, and analytic methods that can strengthen causal inferences and conclusions. Examples include well-designed longitudinal cohort studies with individual-level data linked to time-varying environmental data measured at multiple levels (e.g., states, neighborhoods, families), and approaches that capitalize on natural or quasi-experiments that can be leveraged to identify etiologic (causal) factors and policy impacts.

**RECOMMENDATION 11-7:** The National Institutes of Health and other public and private research entities should support a program of cross-national research aimed at understanding why trends and disparities in working-age mortality have unfolded differently in the United States and in other high-income countries. This program of research should

- examine long-term trends and disparities, beginning in the 1950s;
- include not only transdisciplinary studies of etiology (causation pathways), but also policy research to evaluate the effectiveness of policy approaches in other countries and their potential adaptability to the United States; and
- include a complementary domestic research portfolio focused on understanding long-term changes within the United States at the state and sub-state levels, beginning in the 1980s when these gaps began to widen.



This issue brief is one in a series prepared by the Committee on Population based on the report *High and Rising Mortality Rates Among Working-Age Adults* (2021). The study was sponsored by the National Institutes of Health and the Robert Wood Johnson Foundation. Any findings, conclusions, or recommendations expressed in this publication are those of the study committee and do not necessarily reflect those of the sponsors.

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