

Improving the Quality and Accuracy of Death Certificates in Assessing Mortality Among U.S. Working-Age Adults

For 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. Alarming, 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.

The 2021 National Academies of Sciences, Engineering, and Medicine’s report, *High and Rising Mortality Rates Among Working-Age Adults*, examined vital statistics death certificate data for the period between 1990 and 2017 and identified three broad cause categories of death as the key drivers of increasing working-age mortality and the widening health inequalities that accompany it: drug poisonings and alcohol-induced causes, suicide, and cardio-metabolic diseases. The report also outlined recommendations for future research and data collection to improve understanding around the trends and disparities in U.S. working-age mortality, including improving the accuracy and consistency of information recorded on death certificates. The key issues related to enhancing the quality and accuracy of death certificate information that is used to assess mortality in this age group are summarized below.

QUALITY AND ACCURACY OF DEATH CERTIFICATES IN ASSESSING MORTALITY RATES AMONG WORKING-AGE ADULTS

Death certificates constitute the critical source of data for assessing patterns and trends in U.S. working-age mortality. However, there are inconsistencies in how data on death certificates are collected and recorded that affect their quality and accuracy. For example, differences across states and localities in the training and qualification of medical examiners, as well as the resources available to them, lead to potential geographic and temporal variation in the coding of cause(s) of death. Moreover, the collection and coding of demographic information about decedents, such as race, ethnicity, and educational attainment, has varied across states and over time, limiting researchers’ ability to examine geographic and temporal trends in working-age mortality disparities.

Although autopsies offer a more thorough accounting of factors contributing to cause of death, these examinations are costly and require specialized staff to perform. There is substantial variation across U.S. states and localities in laws identifying the types of deaths that require autopsies, as well as in the resources provided to coroners and medical examiners for conducting them. These variations lead to potential local, regional, and national variations in the quality and accuracy of cause-of-death recording, mak-

ing trend analyses and geographic comparisons of causes of death challenging. More generally, quality of death record reporting is also affected by the training and requirements of local medical certifiers, who are responsible for the accuracy and completeness of cause-of-death reports. Other factors can influence the quality and accuracy of cause-of-death information on death certificates, such as changes in the International.

Classification of Diseases (ICD)—the international standards for coding cause of death—and the complexity of the chain of medical diagnoses that led to death. A new version of the ICD mortality coding system (ICD-10) was implemented in the United States in 1999. One of the features of the ICD-10 system is a standardized schedule for introducing updates to the codes to ensure that the system is flexible and remains consistent with current medical practice and knowledge. The impact of these factors on data quality can be mitigated by improved training in coding complex diagnoses and changes to the cause of death classification system. As such, states and local health agencies need to ensure that certifiers are well trained in cause-of-death recording and the impact of regular updates to the ICD. In light of state-by-state variation and increasing geographic inequalities in U.S. working-age mortality, studies to evaluate state- and local-level variation in coding practices are warranted.

These data quality issues are a particular concern in examining deaths from acute poisoning and drug overdose. The term “drug overdose” is often used synonymously with acute poisoning, but it has multiple coding definitions and is often difficult to define toxicologically and pharmacologically. Moreover, many decedents are found to have multiple substances in their blood or other issues that create uncertainty in identifying the specific cause of death. As a result, more than a quarter of death certificates that implicate drug poisonings do not specify the drug involved, and this leads to an underestimate of the number of deaths that are due to specific drugs, such as opioids.

Demographic information of decedents on death certificates also suffers from data quality issues. On most surveys, including the U.S. Census, this information is either self-reported or reported by a knowledgeable proxy. On death certificates, this information is often provided by surviving relatives or friends or is sometimes drawn from other sources, such as medical records. This can lead to inaccuracies in the coding of this information on death certificates, as well as inconsistencies between death certificate information and the population count data that is used to calculate mortality rates.

The effects of these inconsistencies on mortality rates have been documented for race and ethnicity and educational attainment. Errors in the recording of the race for American Indian and Alaska Native (AI/AN) populations have been particularly challenging, leading to official mortality rates that are far too low. Similar errors have affected the reporting of ethnicity among Hispanics and race among Asians and Pacific Islanders on death certificates in the past, but reporting for these groups has improved over time. However, these improvements in the quality of reporting for racial and ethnic categories have also complicated the examination of trends over time in mortality for these groups.

Similarly, such proxy reporting of educational attainment on death certificates has led to over-reporting of educational attainment and thus an undercounting of deaths among those with low levels of education. When this information is used to calculate education-specific mortality rates, this leads to an underestimation of mortality among those with less education and an overestimation of mortality among those with more education, narrowing estimates of education-based disparities in mortality. States and local health agencies may need to initiate additional training and guidance for those who provide this information on death certificates.

In addition to race and ethnicity and education, death certificates contain additional demographic information that would enable the investigation of mortality disparities, but some of this information is excluded from publicly-released death certificate data files. One such important characteristic is country of birth, which would allow researchers to examine the role of immigration in patterns and trends in racial and ethnic disparities in mortality.

RECOMMENDATIONS

To improve data quality and availability to support analyses of patterns and trends in U.S. working-age mortality, the committee recommends:

RECOMMENDATION 5-1: The National Center for Health Statistics (NCHS), state vital statistics offices, and local-area health agencies should work together to develop a plan and set of activities for improving the accuracy of reporting on U.S. death certificates of educational attainment, American Indian and Alaska Native identity, and multiple causes of death. NCHS should also continue to conduct or facilitate studies on the accuracy of reporting on U.S. death certificates of educational attainment (particularly as such reports may vary across states and local areas) and American Indian and Alaska Native identity (particularly as such reports may vary across states, tribal affiliations, and local areas).

RECOMMENDATION 5-2: The National Center for Health Statistics and the National Institutes of Health should undertake and/or fund studies to evaluate state and local-level variation in cause-of-death coding practices, explore how such variation may contribute to observed mortality trends, and make recommendations for reducing such variation.

RECOMMENDATION 5-3: The National Center for Health Statistics should include Asians in its regular reports on life expectancy estimates and trends in the United States and make an item on place of birth available to researchers in the public-use files, even if such information is at first categorical (e.g., foreign-born vs. U.S.-born) rather than granular.



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