

What Is Population Health and Why Study It in the Twenty-First-Century United States?

In November of 2015, Professors Anne Case and Angus Deaton of Princeton University published a short article in the prestigious *Proceedings of the National Academy of Sciences* that demonstrated an increase in the mortality rate of non-Hispanic White Americans aged 45–54 between 1999 and 2013.¹ Interestingly, they showed that this age-specific mortality increase was not experienced in France, Canada, the United Kingdom, Germany, Sweden, or Australia (figure 1). Nor was it experienced by either Latinos, shown in the figure, or African Americans in the United States. The article also showed that the upsurge in the mortality rate among middle-aged U.S. Whites was largely due to sharp increases in the death rate among those with a high school degree or less. The mortality rate increase among Whites was driven by rapid increases in three causes of death—drug and alcohol poisonings (i.e., overdoses), suicide, and chronic liver diseases and cirrhosis. These cause-specific mortality increases were mirrored by trends in related health problems among middle-aged White Americans over this same period of time, including increases in reports of pain, psychological distress, difficulties with routine activities of daily living, heavy alcohol use, and overall poor health.

Unlike most academic articles, the Case and Deaton paper created *buzz*. It was covered by media outlets all over the country and world, including the *New York Times*, *USA Today*, National Public Radio, the *Washington Post*, Al Jazeera, and CNN. Their research methods, the study findings, and the policy implications of their study were debated

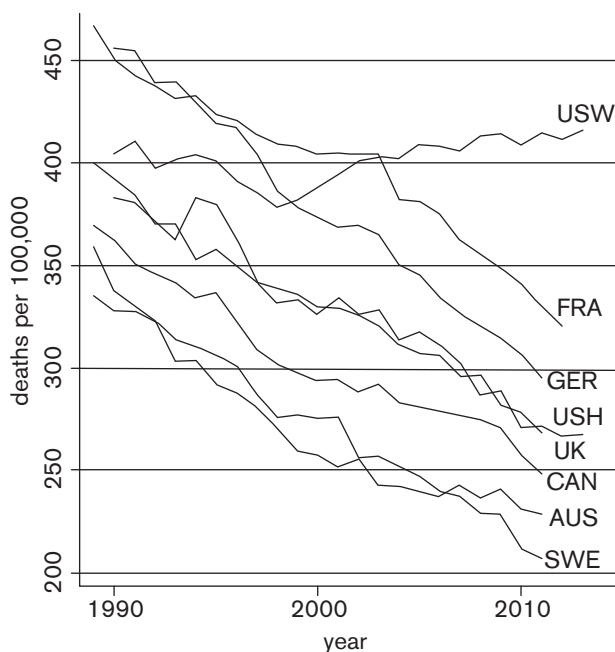


FIGURE 1. All-cause mortality, ages 45–54 for U.S. White non-Hispanics (USW), U.S. Hispanics (USH), and six comparison countries: France (FRA), Germany (GER), the United Kingdom (UK), Canada (CAN), Australia (AUS), and Sweden (SWE). Source: Case and Deaton 2015

on dozens of social and health science blog sites across the country. On the campaign trail, presidential candidate Hillary Rodham Clinton discussed the study as part of a speech on concerns over the American middle class. And leading syndicated opinion writers, including Paul Krugman and Ross Douthat, wrote about the study in their weekly columns. Such vast attention given to an academic article focused on U.S. mortality rates was not only highly unusual; it was nearly unprecedented.

What was all the attention about? While it is true that Professors Case and Deaton are prominent economists—in fact, Deaton won the Nobel Memorial Prize in Economic Science just days before the new study was published—their prominence surely did not explain the hype and debate surrounding the results of their research; something deeper seemed to be triggering the attention of the American media, scientific community, and general public. Perhaps it was the sheer numbers. Indeed, in the “Significance” section of the published study, Case and Deaton calcu-

lated that had the mortality rate among White Americans aged 45–54 continued at the same declining pace that it had experienced over the previous 19 years (1979–98), approximately 500,000 fewer middle-aged Whites would have died between 1999–2013—a death toll comparable to that of the 35-year-old U.S. AIDS epidemic from 1980 through 2015. By anyone’s tally, that is a lot of prematurely lost lives.

Another possible reason for the extensive attention could be the fact that the troubling trends were occurring among non-Hispanic Whites, the most economically well-off racial/ethnic group in the United States. By virtue of their advantaged position in the socioeconomic and power hierarchy of American society, it was unusual that such a rise in mortality was occurring among this group and not so among less well-off and less powerful racial/ethnic minority groups. Perhaps this population health trend received so much attention because of White privilege—that is, as a society that is economically and politically dominated by Whites, media, scholarly, and political attention tends to focus on issues affecting White people more so than other groups. Indeed, far more Black Americans die prematurely in eight years than the number of White Americans who died as a result of the rising mortality rate from 1999 to 2013. And later studies show that the trend was in fact worse for American Indian and Alaskan Natives, a group that Case and Deaton left out of their analysis.²

Yet another explanation for the attention could be that in a very wealthy country like the United States, *mortality rates are not supposed to increase for any group*. Progress in the form of continually decreasing mortality rates and improved health is expected, while upsurges in mortality rates that reflect a decline in the health of the population are both rare and troubling to the country’s collective ego. Thus, perhaps this study attracted such rapid and widespread attention because it signaled something deeply troubling about the health of the nation as a whole.

The Case-Deaton article was not the first alarm bell that recently sounded regarding the nation’s health. In 2011 and 2013, respectively, the National Research Council assembled teams of top health and social scientists to produce companion reports on the health of the United States in comparison to other high-income countries such as Canada, Sweden, Spain, Japan, Australia, and others. The 2011 volume largely focused on mortality patterns for those aged 50 and above, while the 2013 report concentrated on a broader array of health and mortality indicators for those aged 0 through 50.³ Both reports showed that the United States fared among the worst overall on nearly all indicators in comparison with the other high-income countries. The overall health

and mortality indicators for American women were particularly poor in comparison with women in the other countries, but U.S. men also fared poorly on most measures. These prominent reports, along with other related research articles published around the same time, demonstrated that the United States is not only missing from the world's best with regard to a wide range of health indicators, but that our collective health profile is close to the bottom among wealthy countries. Ironically, both volumes pointed out that the United States spends far more on health care per person than any of the other comparison countries, suggesting that the poorer overall health conditions in the U.S. are probably not due to a scarcity of health care resources.⁴

Other prominent studies over the past decade have documented troubling trends in the health profile of particular U.S. population subgroups. While Case and Deaton showed that the increasing mortality rate among middle-aged Whites was largely because those with a high school degree or less experienced an escalating mortality rate between 1999 and 2013, a series of studies over the past 10 years have demonstrated widening gaps in both health and mortality rates when comparing adults with a high school degree or less to those with a college degree or more.⁵ U.S. women with relatively low education appear to be particularly vulnerable. One study found that women with less than 12 years of schooling have an overall lower life expectancy than they did 40 years ago.⁶ Concern also exists with regard to racial/ethnic subgroups of the U.S. population. For example, African Americans continue to live nearly four fewer years than Whites, on average, which equates to the premature loss of approximately 83,000 African American lives *each year*.⁷ That number equates to a large airplane full of African American residents of the United States crashing without survivors every single day, day in and day out. That is an American tragedy. And while Hispanics currently have a longer life expectancy than either African Americans or Whites, the rate of Hispanic old-age disabilities is the highest in the country.⁸ This means that many Hispanics, while living long lives on average, face longer periods of suffering in their older years. Finally, a number of high-quality studies over the past decade have documented enormous geographic differences in the health of Americans. Some neighborhoods, counties, and states appear to have health profiles much closer to those of other high-income countries, while other neighborhoods, counties, and states appear to be falling further and further behind with regard to their overall levels of health and mortality.⁹ For example, Christopher Murray and colleagues have shown that African American males in

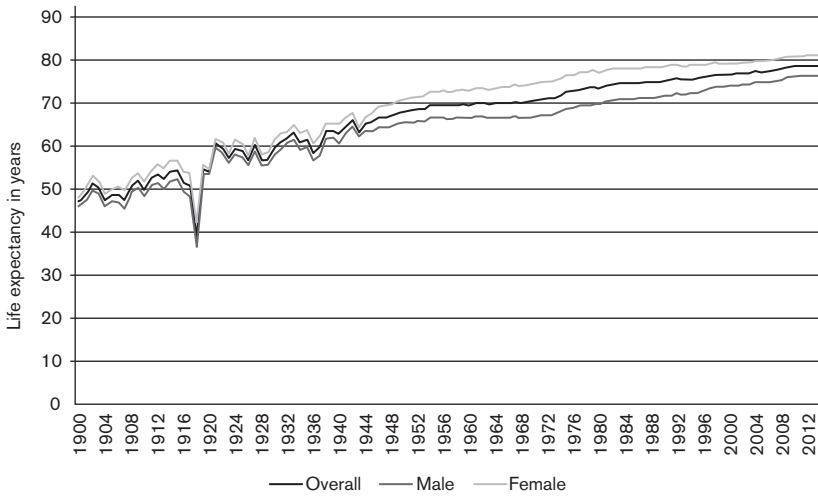


FIGURE 2. Estimated life expectancy at birth, by gender: Death-registration states, 1900–1928, and United States, 1929–2014. Source: Murphy, Kochanek, Xu, and Arias 2015; Arias 2012

some urban areas live, on average, 20 fewer years than the average lifespan of Asian American females.¹⁰

Fortunately, not all U.S. health and mortality trends are disturbing. For example, figure 2 shows that life expectancy increased from about 47 years in 1900 to nearly 79 years in 2014, a change that in and of itself signals a massive improvement in the overall health conditions in the country in just the past 114 years. As figure 2 also shows, these incredible increases in life expectancy were experienced by both women and men, although the gender-specific increases have not always occurred in a parallel fashion. Yet another incredible improvement in health and mortality is evidenced by the long-term declining U.S. infant mortality rate. While about 10% of babies who were born in the United States died before reaching their first birthday in the year 1900, less than 1% of infants died before their first birthday in 2014.¹¹ These increases in life expectancy and decreases in infant mortality are stunning achievements that likewise deserve attention and explanation.

Thus, for reasons that are troubling and for others that are worth celebrating, this book delves into the description and explanation of health and longevity patterns and trends in the United States. We refer to the description and explanation of such patterns and trends as “population health,” a term that we formally define below. We seek to paint a clear, contemporary portrait of U.S. population health patterns by digging into

patterns for the country as a whole and for different population subgroups defined by socioeconomic status, gender, sexual orientation and gender identity, race/ethnicity, and immigrant status. Throughout this portrayal, we also discuss some key trends in population health across time, depending on how far back valid data allow us to go, and how some U.S. population health indicators stack up against other wealthy countries and, internally, across geographic units. There is much to be learned through these temporal and spatial comparisons. We also aim to shed light on some of the reasons why such patterns and trends in U.S. population health exist. Indeed, there has been a tremendous amount of research published on population health over the last couple of decades by sociologists, demographers, geographers, epidemiologists, economists, social workers, nurses, biologists, and medical doctors, just to name a few of the scientific disciplines engaged in this area of research. Each of these disciplines has contributed to the scientific community's understanding of population health patterns and trends. While scientific knowledge continues to develop at a fast and furious pace in this area, here we seek to lay out some of the key explanations for the population health patterns and trends that characterize the United States.

WHAT IS POPULATION HEALTH?

Population health is an interdisciplinary topic of study that is gaining momentum across the country.¹² As one indicator of such momentum, the fledgling Interdisciplinary Association for Population Health Science (IAPHS), which is the only U.S. professional association fully dedicated to population health, was incorporated in 2015 and is holding just its fifth annual meeting in the fall of 2019.¹³ Nonetheless, the study of population health has very strong historical roots in sociology, demography, geography, public health, epidemiology, biology, social work, nursing, medicine, and public policy—and will continue to be closely aligned with those disciplines. Moreover, it is important to note that much research and policymaking focused on population health occurred well before the twenty-first century in these disciplines, although none of them focuses exclusively on this topic.

Increasing scientific and policy attention on population health is in part a reaction to an overly narrow individually and medically based conceptualization of health that dominated American research and policymaking throughout the twentieth century and in many ways continues to do so today. In his recent book on this topic, James House argues that

this individualistic orientation to health may be a key reason why the United States spends more on health care than any other country in the world yet has the poorest population health indicators among all wealthy countries.¹⁴ While not discounting the importance of individual-level factors (e.g., genetics, behavior) in contributing to health, the modern study of population health centrally concerns itself with the ways that inequalities in social, physical, and policy contexts influence health—both for individuals and for entire geographic areas characterized by such contexts. Further, the twenty-first-century study of population health is critical of a narrow vision of health policy that is solely concerned with medical care. Indeed, there is much more to health policy, pertaining both to individuals and to entire places, than health care. Over the years, for example, U.S. society has developed many housing, environmental, civil rights, criminal justice, education, employment, and income policies that, while not often thought of as health policies, have tremendous influence on the health of the population.¹⁵

Overall, then, the study of population health is defined as the documentation of patterns and trends in health within specifically defined geographic places; the explanation of such health patterns and trends in those specific places using a multilevel set of determinants; and the translation of population health research findings into action to improve the health of those specific populations.¹⁶ This definition includes four very important components, to which we now turn.

First, a core purpose of population health research is the *documentation* of patterns of health at one point in time and of trends in health across time in specific geographic places. Accurate description necessarily comes before explanation. And accurate description of population health patterns and trends relies on high-quality data sets that are representative of the geographic place under study. Too often, in our view, researchers do not accurately and carefully document patterns and trends before jumping toward explanations. Careful and accurate documentation is a difficult, and underappreciated, component of population health science.

Second, the study of population health searches for *explanations* of the documented patterns and trends across a multilevel set of factors. These multilevel determinants range from the social, environmental, and policy contexts surrounding the people under study; to the social inequalities (e.g., by gender, race, and socioeconomic status) that individuals experience on a daily basis; to the behaviors, health care experiences, and biological characteristics of individuals. Notably, the study of population

health pays particularly intense attention to inequalities specific to gender, race/ethnicity, and socioeconomic status (i.e., education, employment, income, and wealth) within this multilevel framework because theory and research suggest that individual behaviors, the use of health care, and even our biological systems are strongly affected by these inequalities. Importantly, Bruce Link and Jo Phelan developed *fundamental cause theory* over the past 25 years to highlight the critical roles that socioeconomic status (SES) and racism play in influencing overall population health and disparities in health among the U.S. population.¹⁷ We discuss fundamental cause theory at length in chapters 5 and 6; further, we provide some thoughts regarding its applicability to gender in chapter 7. In a nutshell, the key idea is that high SES embodies individuals with an array of *flexible resources* to use on an everyday basis that work to enhance their health and protect against the risk of death. High SES individuals “carry” these flexible resources around with them day in and day out, using them to their health advantage throughout the life course. These flexible resources include knowledge, money, power, prestige, and beneficial social connections; they are termed “flexible” because they can be used in a wide variety of ways. In contrast, racism and sexism work to limit the availability of flexible resources for health by, for example, restricting individuals in disadvantaged groups from living in certain neighborhoods, preventing them from participating in powerful social institutions, and exposing them to greater levels of stress.

Third, population health researchers are collectively interested in using *research findings* to make a difference in improving health patterns and trends. If, for example, U.S. population health patterns and trends are affected by contextual determinants such as federal gun laws and state-level cigarette taxes, and by social inequalities structured by race and gender, why shouldn’t lawmakers and people in power within key social institutions (e.g., universities, school districts, corporations) seriously consider issues of corporate autonomy, tax policy, racial discrimination, and gender equality as population health policies? Chapter 8 examines population health policy options with an eye toward moving beyond typical discussions that focus on improving individuals’ health behavior and providing them with greater access to health care.

Finally, our definition of population health relies on a geographic-specific orientation. This is an important definitional feature because researchers and policymakers must clearly understand the *specific geographic area* that is being studied to develop appropriate policies and programs to improve health in that place. In the case of this book, the

specific geographic area of focus is the United States. Such geographic specificity distinguishes this definition of population health from one that is regularly used in the medical community, where “population health” often refers to the group of patients who particular hospitals or providers are caring for.¹⁸ While perhaps useful in the health care arena, this definition of population health is overly narrow in focusing on providers and patients, with little or no applicability beyond each provider’s influence. Instead, we argue that health care is not the only determinant of population health; in fact, we contend that the influence of health care on health is dwarfed by the social and contextual factors that shape health on an everyday basis. Thus, by focusing on specific geographic areas, our definition of population health encompasses the complete set of people and the full range of factors that influence a specific population’s health.

A SOCIAL DEMOGRAPHIC PERSPECTIVE OF POPULATION HEALTH

The study of population health is inherently interdisciplinary. That is, it brings together researchers from a very wide range of academic disciplines who document new patterns and trends of health, discover new explanations for such patterns and trends, and inform policies and programs to improve population health. As such, this book draws on work from a range of disciplines and on studies from interdisciplinary research teams. Nonetheless, we bring a specific *social demographic perspective* to the study of population health that draws upon key strengths of sociology and demography.

Sociologically, we draw from the discipline’s core foci on social stratification and social context. A simple but catchy definition of social stratification is the understanding of “who gets what and why.”¹⁹ In our case, the “who” refers both to people in the country as a whole and its various population subgroups; the “what” refers to good health and long lives; and the why refers to the explanations for patterns and trends in health and longevity, both between the United States and other high-income nations and, within the United States, between population subgroups and geographic areas. More formally, social stratification refers to the *systems of inequality* that operate within and across societies to create differences in access to and acquisition of valued resources, including education, occupational status, income, wealth, and a healthy and safe environment.²⁰ Thus, a social stratification perspective on racial/ethnic

inequalities in health focuses on the ways that institutionalized discrimination (e.g., in schools, workplaces, financial institutions, the criminal justice system, and the health care system) works to influence health and longevity disparities by influencing racial and ethnic differences in access to critical health-related resources.²¹ And a social stratification perspective on gender disparities in health emphasizes the ways that gender discrimination and gendered opportunities and constraints influence the health and longevity of women and men by, again, differentiating women's and men's access to health-relevant resources.²²

Not unrelated to issues of social stratification, the importance of social contexts in studies of population health has long been recognized by sociologists. Social contexts refer to the groups and institutions (e.g., families, friendship networks, schools, workplaces, neighborhoods, cities, counties, and states) that structure the norms, behaviors, and health of people who are exposed to such influences.²³ One of Emile Durkheim's classic contributions to the development of sociology as a scientific discipline was his work on differential suicide rates across groups and geographic areas in nineteenth-century Europe, including by religious denomination.²⁴ He demonstrated, for example, that the religious context (e.g., primarily Catholic, Protestant, or Jewish) of different geographic areas was instrumental to the understanding of why suicide rates varied across areas. He also put forward two concepts that continue to help frame present work on understanding why social contexts matter for population health: social integration and social regulation. Social integration refers to the social ties and support that are garnered from social contexts. That is, individuals in some contexts are more likely to be involved in a network of supportive friendships and to participate in healthy social activities in comparison to those in other social contexts. Social regulation is a second important concept to consider. In this case, social contexts help shape the health of individuals living in such contexts, through mechanisms such as formal (e.g., policy) and informal regulations on behavior. In this book, we emphasize multiple levels of social context, including those of the family, friendship networks, schools and workplaces, neighborhoods, and larger geographic units such as cities, counties, and states.

The centrality of social stratification and social contexts in our approach to population health does not dismiss the importance of genetic endowments, psychological traits, individual decision-making regarding health behavior, and individually tailored medical care in contributing to the health of individuals. These are all critical factors for understanding

individual-level health. And if, for example, medical care is outstanding in one geographic area and of poor quality in another, such differences in provider care can add up to population health disparities. In other words, health-related decision-making and the use and quality of health care are themselves constrained by social resources. Furthermore, psychological traits and genetic endowments interact with the social environment to affect health. For example, Jason Boardman has shown that people who are genetically susceptible to smoking are especially likely to smoke more in states that have lower taxes on cigarettes; in states with higher cigarette taxes, genetic susceptibility to smoking is lessened.²⁵ Put another way, the social context is a very important modifier of “genetic effects.” Thus, the assessment of population health in the United States and disparities therein necessarily must give central priority to the level and distribution of social resources and the social contexts that influence the overall health of the country and its constituent subgroups.

Our perspective on population health also draws heavily from demography, which is the scientific study of human populations. One of the fundamental strengths of demography is its obsession with population representativeness; that is, the data and methods that demographers utilize result in descriptions (e.g., rates) and relationships (e.g., correlations) that are true in the overall population and among its subgroups.²⁶ Population representativeness is accomplished either through the collection and use of complete data for every person in an entire population or through the careful collection and use of samples from the general population who represent the population as a whole. Such population-based health data contrast with health data from hospitals, clinics, or other nonrepresentative samples, such as volunteers for a research study. Studies based on nonrepresentative data cannot make valid scientific claims about the population health of the country as a whole or among its major subgroups because the individuals included in such data sets may differ in important ways from all individuals in that population. Because the focus of this book is population health in the United States, we draw on nationally representative data or on published findings from population-based data sets that allow us to most effectively make accurate statements about patterns and trends of health for the United States as a whole and for many of its largest population subgroups and geographic locales.

In short, the demographic approach to population health provides a formidable set of tools to describe population health patterns and trends in the United States and to make cross-national comparisons. The use of population representative data sets and appropriate statistical tools

facilitates such accurate description. The sociological approach to population health, in turn, provides a powerful lens through which to view population health patterns and trends in the United States, albeit not to the exclusion of other potentially useful explanatory perspectives. In particular, a social stratification lens to population health focuses on how critical health-related resources are distributed and, in turn, how the distribution of such resources informs patterns and trends of population health. Moreover, a social contextual approach to population health considers the multiple levels of influence (e.g., families and households, schools, workplaces, neighborhoods, counties, states) that individuals are embedded within, thus moving well beyond an individually based approach to the understanding of health. Together, then, key features of sociology and demography combine to comprise the social demographic perspective to population health. This approach is useful not only for describing and explaining health patterns and trends but also for informing health policy at the population level because it is based on representative data and focuses on social and economic resources—like education, income, and wealth—and social contexts—like schools, workplaces, and neighborhoods—that are both health related and policy amenable.²⁷

MEASURING POPULATION HEALTH

This chapter has already mentioned four key measures of population health—mortality rate, life expectancy, infant mortality rate, and the rate of old age disabilities—without defining these terms or discussing how they are calculated. From our own experience watching television news and reading newspapers and websites, we know that “loose use” of such measures is common. But as scientists, it is important to understand the formal definitions of the most often-utilized measures of population health so that accurate and common understandings can be achieved. Here, we rely on the field of demography to supply us with some very useful concepts and measures to best document patterns and trends in population health. Note that we do not attempt to offer a complete overview of population health concepts and measures. Rather, we provide an introduction to the concepts and measures we use most frequently throughout the book. In each chapter, we also discuss measures of population health in a manner that is as clear as possible. Nonetheless, this short section serves to guide readers through the measures that will be seen most frequently throughout the upcoming chapters.

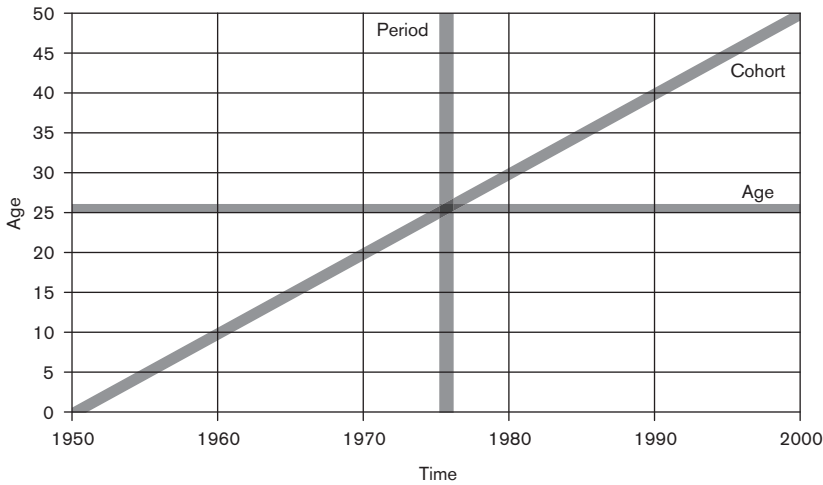


FIGURE 3. Sample Lexis Diagram, 1950–2000.

To begin, we refer to one of the fundamental tools of demography: The Lexis Diagram (figure 3).²⁸ The Lexis Diagram is a useful way to frame our thinking about the measurement of population health because it specifies time in three uniquely important dimensions. First, on the y-axis of figure 3 is age, in this example ranging from 0 up to 50. Here, we have shaded age 25 across the Lexis Diagram. Using this example, we can refer to the population health of all 25-year-olds who live in a specific geographic area. We can do so for a specific year (such as 1975) or we can track trends in population health for 25-year-olds across historical time, such as between 1950 and 2000. Such age-based indicators are more specifically referred to as age-specific measures of population health. Turning back to the opening paragraphs of this chapter, Case and Deaton’s paper focused on mortality rates for the 45–54 year-old U.S. adult population as they changed between 1997 and 2011; this is a clear example of the use of an age-specific measure to track a trend in population health across time. Age-specific measures give us a sense of how measures of population health vary across stages of the life course.

The x-axis in the Lexis Diagram depicts historical time, in years, which can also be referred to as period-specific time. For illustrative purposes, we have shaded the year 1975 in figure 3. Any population health indicator specific to a certain year like 1975, then, is a period-specific measure that refers to the health of persons living in a specific geographic area in that

specific year. Period-specific measures are very common in the study of population health; for example, we can refer to the life expectancy of U.S. residents in 1975 or the rate of physical disabilities for the U.S. population aged 65 and over in 1975. Population health data are commonly collected and made available on a period-specific basis, thus facilitating much research using period-specific measures. Period-specific measures give us a sense of how population health varies across historical time.

Third, figure 3 also shows a diagonal bar that cuts across both age and historical time. This diagonal bar refers to a birth cohort, which is defined as the complete set of individuals born in a specific year in a specific geographic place. The example provided in figure 3 highlights the birth cohort of 1950. By following this cohort from the bottom left to the top right of the Lexis Diagram, it is clear that this whole birth cohort gets older together and moves through historical time together. Measurement-wise, this means that we can track the population health of the 1950 birth cohort as it moves diagonally through historical time and across different stages of the life course. Thus, for example, we can measure the probability that members of this cohort are diagnosed with diabetes by age 40; or, we can compare the population health of this cohort at age 30 (i.e., in 1980) to the population health of the birth cohort of 1970 at age 30 (i.e., in 2000) to best understand how population health differs from cohort to cohort. Cohort-specific measures give us a sense of population health for people who are a specific age within a particular generation.

The recognition and understanding of these three unique dimensions of time—age, period, and cohort—are critical to the measurement of population health. Scientists must be careful when describing measures of population health so as to not confuse or mislead readers regarding patterns, which represent the distribution of health at a specific time, and trends, which represent changes in patterns of health across time. In the following three subsections, we first discuss the centrality of age for the measurement of population health, then briefly highlight the most common period- and cohort-specific measures of population health that we use throughout the book.

The Fundamental Importance of Age for Measuring Population Health

It is not a surprise, but nonetheless of fundamental importance to the understanding of population health, that measures of health and mortality

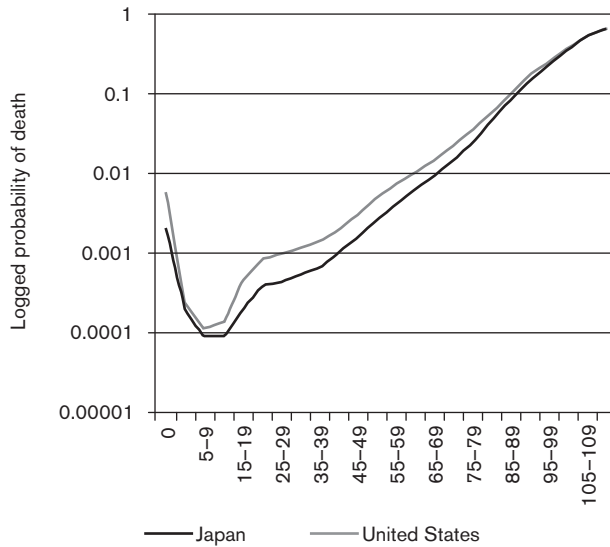


FIGURE 4. Age-specific mortality rates (log scale) for Japan and the United States, 2014. Source: University of California, Berkeley (USA) and Max Planck Institute for Demographic Research (Germany), n.d.

vary strikingly by age. For example, children and adolescents (thankfully) have very low rates of most chronic diseases and from most causes of death, while rates for older people tend to be much, much higher. Just this simple reminder of the very strong relationship between age and health is convincing enough that scientists simply cannot ignore age in any useful analysis of population health patterns or trends. Further, populations (e.g., the United States) and subpopulations (e.g., women and men) tend to have different age distributions. The United States, for example, has a much younger age distribution than Japan; the median age of the U.S. population in 2017 was 39.4 while Japan's median age was 48.7.²⁹ Given the much older age distribution in Japan compared with the United States, Japan's crude death rate—the number of deaths per 1,000 residents of Japan during 2017—was higher than that of the United States.³⁰ But Japan's higher crude death rate does not mean its population health is inferior to that of the United States; it simply has an older population than the United States. In fact, Japan has lower age-specific mortality rates at all ages than the United States, as demonstrated in figure 4. Thus, when age is properly accounted for, Japan's level of population health, at least as