CHAPTER 2
Health Determinants, Measurements, and the Status of Health Globally

LEARNING OBJECTIVES

By the end of this chapter, the reader will be able to do the following:

- Describe the determinants of health
- Define the most important health indicators and key terms related to measuring health status and the burden of disease
- Discuss the status of health globally and how it varies by country income group, region, and age group

Vignettes

Maria is a poor woman who lives in the highlands of Peru. She is from an ethnic group called Quechua. In Peru, poor people tend to live in the mountains and be indigenous, be less educated, and have worse health status than other people. In Eastern Europe, the same issues occur among ethnic groups that are of lower socioeconomic status, such as the Roma people. In the United States, there are also enormous health disparities, as seen in the health status of African Americans and Native Americans, compared to white Americans. If we want to understand and address differences in health status among different groups, how do we measure health status? Do we measure it by age? By gender? By socioeconomic status? By level of education? By ethnicity? By location?

Yeveceny is a 56-year-old Russian male. Life expectancy in Russia in 1985 was about 64 years for males and 74 years for females. It then fell to about 59 years for males and 72 years for females in 2001, before rising again to 67 for males and 77 for females in 2016. What does life expectancy at birth measure? What are the factors contributing to the earlier decline in life expectancy at birth in Russia? What has happened to trends in life expectancy in other countries? Which countries have the longest and shortest life expectancies, and why?

Sarah is a 27-year-old woman in northern Nigeria. While women in high-income countries very rarely die of pregnancy-related causes and have a maternal mortality ratio of about 10 per 100,000 live births, the maternal mortality ratio for women in low-income countries like Sarah is about 500 per 100,000 live births. This is 50 times higher than that
in the best-off country income group. What does the maternal mortality ratio suggest about a country? What does it say about the status of women in that country? What does it indicate about the access of women to obstetric and emergency obstetric care of appropriate quality?

Abdul is a 4-year-old in northern India. For every 1,000 children born in South Asia in 2016, about 50 will die before their first birthday. The rate of child death is even higher in sub-Saharan Africa. In the cohort of 1,000 children born there in 2016, almost 80 will die before they are five. These two regions have the worst child mortality rates.\(^5\)

The Importance of Measuring Health Status

If we want to understand the most important global health issues and what can be done to address them, then we must understand what factors have the most influence on health status, as well as how health status is measured.

This chapter, therefore, covers two distinct but closely related topics. The first section concerns what are called the determinants of health. That section examines the most important factors that relate to people's health status. The second section reviews some of the most important indicators of health status and how they are used.

The Determinants and Social Determinants of Health

Why are some people healthy and some people not healthy? When asked this question, many of us will respond that good health depends on access to health services. Yet, as you will learn, whether or not people are healthy depends on a large number of factors, many of which are interconnected, and most of which go considerably beyond access to health services.

The World Health Organization (WHO) defines the determinants of health as the “range of personal, social, economic and environmental factors which determine the health status of individuals or populations.” WHO defines the social determinants of health as the “conditions in which people are born, grow, live, work and age.”

There has been considerable writing about the determinants and social determinants of health, which different organizations depict in a range of ways. The next section builds on the work of a number of actors and agencies. It briefly discusses the determinants and social determinants of health and how they influence health. It is essential to understand these concepts if one wants to understand why people are healthy or not and what can be done to address different health conditions in different settings. Figure 2-1 shows one way of depicting the determinants of health.

The first group of factors that helps to determine health relates to the personal and inborn features of individuals. These include genetic makeup, sex, and age. Our genetic makeup contributes to what diseases we get and how healthy we are. One can inherit, for example, a genetic marker for a particular disease, such as Huntington's disease, which is a neurological disorder. One can also inherit the genetic component of a disease that has multiple causes, such as breast cancer. Sex also has an important relationship with health. Males and females are physically different, for example, and may get different diseases. Females face the risks involved in childbearing. They also get cervical and uterine cancers that males do not. Females have higher rates of certain health conditions, such as thyroid and breast cancers. For similar reasons, age is also an important determinant of health. Young children in low- and middle-income countries often die of diarrheal disease, whereas older people are much more likely to die of heart disease, to cite one of many examples of the relationship between health and age.

Individual lifestyle factors, including people's own health practices and behaviors, are also important determinants of health. Being able to identify when you or a family member is ill and needs health care can be critical to good health. One's health also depends greatly on how one eats, or if one smokes tobacco, drinks too much alcohol, or drives safely. We also know that being active physically and getting exercise regularly is better for one's health than being sedentary.

The extent to which people receive social support from family, friends, and community also has an important link with health.\(^4\) The stronger the social networks and the stronger the support that people get from those networks, the healthier people will be. Of course, culture is also an extremely important determinant of health.\(^9\)

Living and working conditions also exert an enormous influence on health. These include, for example, housing, access to safe water and sanitation, access to nutritious food, and access to health services. Crowded housing, for example, is a risk factor for the transmission of tuberculosis. The lack of safe water and sanitation, coupled with poor hygiene in many settings, is one of the major risk factors for the diarrheal disease that is associated with so much illness and death in young children. Nutrition is central to health,
beginning at conception, and families have to be able to access appropriate foods to promote good health. Of course, even if other factors are such important determinants of health, one’s health does depend on access to appropriate healthcare services. Even if one is born and raised healthy and engages in good health behaviors, access to health services of appropriate quality is important to maintaining good health. To address the risk of dying from a complication of pregnancy, for example, one must have access to health services that can carry out an emergency cesarean section if necessary. Even if the mother has had the suggested level of prenatal care and has prepared well in all other respects for the pregnancy, in the end, certain complications can only be addressed in a healthcare setting.

A range of socioeconomic factors, including culture, education, and socioeconomic status, are important determinants of health. The broader environment is also a critical health determinant. Socioeconomic status refers to a person’s economic, social, and work status. It is highly correlated with educational attainment. People with higher educational attainment have better economic opportunities, higher socioeconomic status, and more control over their lives than people of lower educational status. As one’s socioeconomic status improves, so does his or her health.10

More specifically, education is a powerful determinant of health for several reasons. First, it brings with it knowledge of good health practices. Second, it provides opportunities for gaining skills, getting better employment, raising one’s income, and enhancing one’s social status, all of which are also related to health. Studies have shown, for example, that the single best predictor of the birthweight of a baby is the level of educational attainment of the mother.11 Most of us already know that throughout the world there is an extremely strong and positive correlation between the level of education and all key health indicators. People who are better educated eat better, smoke less, have less obesity, have fewer children, and take better care of their children’s health than do people with less education. It is not a surprise, therefore, that they

FIGURE 2-1 The Determinants of Health

PHOTO 2-1 The circumstances in which people live have a profound impact on their health. This is a slum in Jakarta, Indonesia. In what ways would living here influence the health of the slum dwellers? © Nikada/E+/Getty Images.
and their children live longer and healthier lives than do less well-educated people and their children.

Culture also exerts a profound impact on health. Culture shapes how one feels about health and illness, how one uses health services, and the health practices in which one engages. In addition, the gender roles that are ascribed to women in many societies also have an important impact on health. In some settings, women may be treated more poorly than men and this, in turn, may mean that women have less income, less education, and fewer opportunities to engage in employment. All of these militate against their good health.

The environment, both indoor and outdoor, is a powerful determinant of health. Related to this is the safety of the environment in which people work. Although many people know about the consequences of outdoor air pollution for health, fewer people are aware of the consequences of indoor air pollution to health. In many low- and middle-income countries, families, and usually women, cook indoors with poor ventilation, thereby creating an indoor environment that may be full of smoke and that increases the risk of respiratory illness and asthma. The lack of safe drinking water and sanitation is a major contributor to ill health in poor countries. In addition, many people in those same countries work in environments that are unhealthy. Because they lack skills, socioeconomic status, and opportunities, they may work without sufficient protection from hazardous chemicals, in polluted air, or in circumstances that expose them to occupational accidents.

The approach that governments take to different policies and programs in the health sector and in other sectors also has an important bearing on people's health. People living in a country that promotes high educational attainment, for example, will be healthier than people in a country that does not promote widespread education of appropriate quality because better-educated people engage in healthier behaviors. A country that has universal health insurance is likely to have healthier people than a country that does not insure its entire population because the uninsured may lack needed health services. The same would be true, for example, for a country that promoted safe water supply for its entire population, compared to one that did not.

As we think about the determinants of health, we should be aware that increasing attention is being paid to the social determinants of health. In 2005, WHO created a Commission on the Social Determinants of Health. WHO published the commission's report in 2008. The report highlighted some of the following themes:

- Health status is improving in some places in the world but not in others.
- There are enormous differences in the health status of individuals within countries, as well as across countries.
- The health differences within countries are closely linked with social disadvantage.
- Many of these differences should be considered avoidable, and they relate to the way in which people live and work and the health systems that should serve them.
- People's life circumstances, and therefore their health, are profoundly related to political, social, and economic forces.
- Countries need to ensure that these forces are oriented toward improving the life circumstances of the poor, thereby enabling them to enjoy a healthier life as well. The global community should also work toward this end.

We should also note the importance to health of child development, including the ways in which families nourish and care for infants and young children, beginning at conception. Being born premature or of low birthweight can have important negative consequences on health over the life course. There is a strong correlation between the nutritional status of infants and young children and the extent to which they meet their biological and intellectual potential, enroll in school, or stay in school. In addition, poor nutritional status in infancy and early childhood may be linked with a number of noncommunicable diseases later in
life, including diabetes and heart disease. There is also considerable evidence that a range of stressors, including poverty, abuse, and discrimination, have a powerful impact on the health of children that may continue through adulthood.

Finally, as we think about the determinants and social determinants of health, it is important to consider how, directly and indirectly, different factors influence health. One framework for such consideration is shown in Figure 2-2. This framework places the determinants of health into three categories based on the directness of their influence on health: root causes at the macro/societal level; underlying causes at the meso/community level; and proximal causes at the immediate/interpersonal level. Viewing the determinants of health in this manner should also be helpful in assessing why health conditions exist and what can be done to address them.

### Key Health Indicators

It is critical that we use data and evidence to understand and address key global health issues. Some types of health data concern the health status of people and communities, such as measures of life expectancy and infant and child mortality, as discussed further hereafter. Some concern health services, such as the number of nurses and doctors per capita in a country or the indicators of coverage for certain health services, such as immunization. Other data concern the financing of health, such as the amount of public expenditure on health or the share of national income represented by health expenditure.

There are a number of very important uses of data on health status. We need data, for example, to know from what health conditions people suffer. We also need to know the extent to which these conditions cause people to be sick, be disabled, or die. We need data to carry out disease surveillance. This helps us understand if particular health problems such as cancer, influenza, polio, or malaria are occurring, where they are infecting people, who is getting infected, and what might be done to address these conditions. Other forms of data also help us to understand the burden of different health conditions, the relative importance of them to different societies, and the importance that should be given to dealing with them.

If we are to use data in the previously mentioned ways, then it is important that we use a consistent set of

![Figure 2-2](https://example.com/figure2_2.png)

**Selected Examples of Root, Underlying, and Immediate Determinants of Health**

indicators to measure health status. In this way, we can make comparisons across people in the same country or across different countries. There are, in fact, a number of indicators that are used most commonly by those who work in global health and in development work. These are listed and defined in Table 2-1.

The section that follows will examine these key indicators of health status in two ways, first by World Bank region and second by country income group. The graphics will reflect a number of points quite starkly:

- There is a very strong correlation between country income group and health status. The lower the income group, the lower the status; the higher the income group, the higher the status.
- In all cases, sub-Saharan Africa has the worst health indicators of all World Bank regions, and South Asia has the second worst health indicators.

You will understand better as you progress in your study of global health that part of the relatively low health status of sub-Saharan Africa and South Asia is related to the fact that these are the two regions with the lowest per capita income. However, as you will read about here and elsewhere, their relatively low health status also has to do with government policies and programs, the lack of safe water and sanitation, low levels of education, and a number of other factors.

It is also important to understand that country income level does not have to determine a country’s health status. Rather, as you will also read about throughout this text and elsewhere, resource-poor countries that make wise policy choices in fair ways can enable better health for their people than their income level might suggest. This has certainly been the case for a number of countries whose development history is well known, such as Cuba, Sri Lanka, and China. Thus, it will be essential as you think about key issues in global health to always keep in mind questions about which policies can help to achieve the best health for any population at the least cost and in fair, doable, and sustainable ways. In light of all this, let us now turn to exploring the specific health indicators.

Among the most commonly used indicators of health status is life expectancy at birth. Life expectancy at birth is “the average number of additional years a newborn baby can be expected to live if current mortality trends were to continue for the rest of that person's life.” Other words, it measures how long a person born today can expect to live, if there were no change in their lifetime in the present rate of death for people of different ages. The higher the life expectancy at birth, the better the health status of a country. In the United States, a high-income country, life expectancy at birth in 2016 was about 79 years; in Jordan, a middle-income country, life expectancy was 74 years; in Sierra Leone, a very low-income country, life expectancy was 52 years.17

Figure 2-3 shows life expectancy at birth by country income level. This figure shows an exceptional correlation between country income group and life expectancy. It also shows the range of life expectancy across country income groups, from 63 years in low-income countries to 29 percent higher, or 81 years, in high-income countries.

Table 2-1 Key Health Status Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Infant mortality rate</strong></td>
<td>The number of deaths of infants under age 1 per 1,000 live births in a given year</td>
</tr>
<tr>
<td><strong>Life expectancy at birth</strong></td>
<td>The average number of years a newborn baby could expect to live if current mortality trends were to continue for the rest of the newborn’s life</td>
</tr>
<tr>
<td><strong>Maternal mortality ratio</strong></td>
<td>The number of women who die as a result of pregnancy and childbirth complications per 100,000 live births in a given year</td>
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<tr>
<td><strong>Neonatal mortality rate</strong></td>
<td>The number of deaths of infants under 28 days of age in a given year per 1,000 live births in that year</td>
</tr>
<tr>
<td><strong>Under-5 mortality rate (child mortality rate)</strong></td>
<td>The probability that a newborn baby will die before reaching age 5, expressed as a number per 1,000 live births</td>
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FIGURE 2-4 shows life expectancy by World Bank region. It reflects the points noted previously, with sub-Saharan Africa and South Asia having the lowest life expectancy. It is also important to note that the region with the highest life expectancy has a life expectancy that is 19 years, or about 30 percent, greater than the region with the lowest life expectancy.

The maternal mortality ratio is a measure of the risk of death that is associated with childbirth. Because these deaths are more rare than infant and child deaths, the maternal mortality ratio is measured as "the number of women who die as a result of pregnancy and childbirth complications per 100,000 live births in a given year." The rarity of maternal deaths and the fact that they largely occur in low-income settings also contribute to maternal mortality being quite difficult to measure. Very few women die in childbirth in rich countries; for example, the maternal mortality ratio in Sweden in 2016 was 4 per 100,000 live births. On the other hand, in very poor countries, in which women have low status and where there are few facilities for dealing with obstetric emergencies, the ratios can be over 700 per 100,000 live births, as they were in 2016, for example, in the Central African Republic, Liberia, Nigeria, Somalia, and South Sudan. In the worst-off country for maternal health, Sierra Leone, the maternal mortality ratio is estimated to be 1,360 per 100,000 live births. FIGURE 2-5 gives the maternal mortality ratio by country income group, and FIGURE 2-6 shows the same data by World Bank region.

As suggested earlier, the pattern of the maternal mortality ratio, by both country income group, is reflected in FIGURE 2-4.
and region, is similar to that for life expectancy. However, the differences among regions and country income groups are even greater. The low-income group, with the worst maternal mortality ratio, has a 50 times greater ratio than the high-income group. Sub-Saharan Africa has a ratio that is 42 times greater than in North America. Many people believe that the maternal mortality ratio is the indicator that is most sensitive to a country’s overall development status and best reflects the place of women in different societies.

Another important and widely used indicator is the infant mortality rate. The infant mortality rate is “the number of deaths of infants under age 1 per 1,000 live births in a given year.” The rate is expressed in deaths per 1,000 live births. In other words, it measures how many children younger than 1 year of age will die for every 1,000 who were born alive that year. Each country seeks as low a rate of infant mortality as possible, but we will see that the rate varies largely with the income status of a country. Afghanistan, for example, had an infant mortality rate in 2016 of 53 infant deaths for every 1,000 live births, whereas in Sweden only about 2 infants die for every 1,000 live births. Figure 2-7 shows the infant mortality rate by country income group. Figure 2-8 shows the infant mortality rate by World Bank region.

There are no surprises for these data either, which vary in the same directions as life expectancy and the maternal mortality ratio. In this case, however, the highest rates of infant mortality are both about 10 times greater than the lowest rates.

Although the infant mortality rate is a powerful indicator of the health status of a country, most children younger than 1 year of age who die actually die in the first month of life. Thus, the neonatal mortality...
rate is also an important health status indicator. This rate measures "the number of deaths to infants younger than 28 days of age in a given year, per 1,000 live births in that year." Like the infant mortality rate, this rate will generally vary directly with the level of income of different countries. Poorer countries will usually have a much higher neonatal mortality rate than richer countries. Sierra Leone, among the poorest countries in the world, had a neonatal mortality rate of 33 per 1,000 live births in 2016. In Norway, one of the highest-income countries in the world, the rate that year was 2 per 1,000 live births.  

The poorest countries have a neonatal mortality rate that is 9 times that of the best-off countries. The two regions with the worst rates have neonatal mortality rates that are 7 times higher than the region with the best rate. 

The under-5 child mortality rate is also called the child mortality rate. This is “the probability that a newborn will die before reaching age five, expressed as a number per 1,000 live births.” Like the infant mortality rate, this rate is expressed per 1,000 live births. This rate also varies largely with the wealth of a country. In the highest-income countries, the rate is generally about 3 to 5 per 1,000 live births. However, in some of the poorest countries, such as Chad, the rate can be over 125 per 1,000 live births. The under-5 child mortality rate is depicted in FIGURE 2-11 by country income group and in FIGURE 2-12 by World Bank region. 

As expected, the relative standing of different regions in under-5 child mortality, as shown in 

FIGURE 2-7 Infant Mortality Rate by World Bank Country Income Group, 2016 


FIGURE 2-8 Infant Mortality Rate by World Bank Region, 2016 

the figures, looks very similar to that for neonatal mortality and for infant mortality. In both cases for under-5 child mortality, however, the highest rates are about 15 times the lowest rates. To a large extent, this reflects the fact that in high-income countries the risks for young child death post-infancy are relatively few, but in the least well-off regions, especially in sub-Saharan Africa, there are substantial risks to child health not only for neonates and infants but also between a child’s first and fifth years. This is illustrated in Figure 2-13.

A few other concepts and definitions are important to understand as we think about measuring health status. The first is morbidity. Essentially, this means sickness or any departure, subjective or objective, from a psychological or physiological state of well-being. Second is mortality, which refers to death. A death rate is the number of deaths per 1,000 population in a given year. The third is disability. Although some conditions cause people to get sick or die, they might also cause people to suffer the “temporary or long-term reduction in a person’s capacity to function.”

There will also be considerable discussion in most readings on global health of the prevalence of health conditions. This refers to the number of people suffering from a certain health condition over a specific time period. It measures the chances of having a disease. For global health work, one usually refers to point prevalence of a condition, which is “the proportion of the population that is diseased at a single point in time.” Let’s say, for example, that the point prevalence of HIV/AIDS among adults in South Africa was estimated to be 18.9 on the last day of 2016.
This means that 18.9 percent of all adults between the ages of 15 and 49 in South Africa were estimated that day to be HIV-positive.

The incidence rate is also a very commonly used term. Ths measures how many people get a disease, for a specified number of people at risk, for a given period of time. The denominator for the rate usually depends on how commonly the disease occurs in a year and is often per 1,000 or per 100,000 people. In India, for example, the incidence rate for tuberculosis (TB) in 2016 was 211 per 100,000 people. Ths means that for every 100,000 people in India, 211 got active TB disease in 2016.

Many people confuse incidence rate and prevalence rate. It may be convenient to think of prevalence as the pool of people with a disease at a particular time and incidence as the flow of new cases of people with that disease into that pool. You should note, of course, that the size of the pool will vary as new cases flow into the pool and old cases flow out, as they die or are cured.

We will also speak about primary prevention, secondary prevention, and tertiary prevention. These are defined as follows:

Primary prevention: Intervening before health effects occur, through measures such as vaccinations, altering risky behaviors (poor eating habits, tobacco use, etc.), and banning substances known to be associated with a disease or health condition.

Secondary prevention: Screening to identify diseases in the earliest stages, before the onset of signs and symptoms, through measures such as mammography and regular blood pressure testing.

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**FIGURE 2-11** Under-5 Mortality Rate by World Bank Country Income Group, 2016


**FIGURE 2-12** Under-5 Mortality Rate by World Bank Region, 2016

Tertiary prevention: Managing disease post-diagnosis to slow or stop disease progression through measures such as chemotherapy, rehabilitation, and screening for complications.25

Finally, one needs to be familiar with how diseases get classified. When you read about health, there will be discussions of communicable diseases, non-communicable diseases, and injuries. Communicable diseases are also called infectious diseases. These are illnesses that are caused by a particular infectious agent and that spread directly or indirectly from people to people, animals to people, or people to animals.22 Examples of communicable diseases include influenza, measles, and HIV. Noncommunicable diseases are illnesses that are not spread by any infectious agent, such as hypertension, coronary heart disease, and diabetes, even though they might have an infectious cause, such as cervical cancer. Injuries include, among other things, road traffic injuries, falls, drownings, poisonings, and violence.26

Vital Registration

The quality of data on population and health depends in many ways on the extent to which countries maintain a system of vital registration that can accurately record births, deaths, and the causes of death. Unfortunately, this is not the case in many low- and lower middle-income countries.27 They generally have only rudimentary systems for vital registration, which cannot fulfill either their statistical or their legal purposes. In addition, access to vital registration systems is highly inequitable, with higher-income groups enjoying much better access than less well-off people (FIGURE 2-14). UNICEF...
estimates that about 25 percent of all of the births in the world are never registered.28

There are also cultural barriers to timely vital registration because people in many countries wait until a child is a certain age before registering the birth. Coupled with the lack of access to vital registration, this means the existence of some children is never officially known because they die before their births are registered. There are also enormous difficulties with accurate indications of causes of death in countries that have weak health systems and a limited number of well-trained physicians. This is especially so for causes of death of adults.

The former director-general of WHO, Lee Jong-Wook, noted in a speech to his colleagues: “To make people count, we first need to be able to count people.”29(p1569) To overcome the lack of effective vital registration systems in many low- and middle-income countries, a number of tools, such as surveys and projection models, have been developed. Some, like the Demographic and Health Surveys, have become an important source of information about health, population, nutrition, and HIV in low-income countries.

In the longer term, however, the world would be better served by helping countries further develop their own vital registration systems. This would allow countries and their development partners to more accurately gauge the nature of key demographic and health issues and the progress made toward resolving them. Moving in this direction will require assessments of vital registration systems. It will also require programs to improve the organization and functioning of vital registration departments. This will have to include, among other things, strengthening their methods to improve the quality of vital statistics, including for the causes of death, and enhancing their approach to publishing data.27

Study Questions

1. What do we mean when we talk about “the determinants of health”?
2. Which determinants have a more direct and which have a less direct impact on people’s health?
3. Why are the social determinants of health considered to be so important?
4. What are the factors that have most determined your personal health?
5. What are the factors that would most determine the health of a poor person in a low-income country?
6. If you could pick only one indicator to describe the health status of a low-income country, which indicator would you use and why?
7. In your own country, what population groups have the best health indicators and why?
8. In your country, what population groups have the worst health status and why?
9. What might prevent a country from having an effective vital registration system, and how could such systems be strengthened?
10. How much credence should you put in data on key global health indicators?
References


