SECTION I

GLOBAL HEALTH ISSUES, POLICY, AND HEALTHCARE DELIVERY

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Global Health: An Introduction

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Objectives

After completing this chapter, the reader will be able to:

1. Define global health.
2. Identify global health terminology, agencies, and significant historical events.
3. Relate the state of the world's population growth and relevance to world health.
4. Discuss the Sustainable Development Goals and the latest progress made toward their attainment.
5. Relate reasons for health and healthcare disparities worldwide.
6. Define indices of health.
7. Compare and contrast the universal "right to health care" and realistic global healthcare access.
8. Relate global health and healthcare priorities.
9. Discuss the current opioid epidemic issues.
10. Discuss the issues related to global migration of healthcare workers.

WHAT IS GLOBAL HEALTH?

Global health is an area of study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide. It is determined by problems, issues, and concerns that transcend national boundaries, and it emphasizes transnational health issues, determinants, and solutions. Global health involves many disciplines within and beyond the health sciences and promotes interdisciplinary collaboration. It is focused on people across the whole planet, rather than the concerns of particular nations. Global health includes the

worldwide improvement of health, reduction of disparities, and protection against global threats that disregard national borders (Beaglehole & Bonita, 2010; De Cock et al., 2013; Koplan et al., 2009; Macfarlane et al., 2008).

Globalization

Globalization is the increased interconnectedness and interdependence of people and countries. In the 1960s, the World Bank first advocated global thinking in regard to health issues with the phrase, "Think globally and act locally" (Beaglehole & Yach, 2003). There are negative aspects to globalization, which include global warming, cross-border pollution, financial crises, international crime, and the spread of human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) and the Ebola virus.

The globalization of disease began with the European explorers and conquerors who came to the Americas and spread smallpox, measles, and yellow fever among the various indigenous populations. They also brought typhus, influenza, and the plague. The poorest were the most vulnerable, whereas the small groups of elite, wealthy people had better nutrition, better health care, and better sanitary (hygienic) conditions. More recently, the spread of HIV/AIDS, tuberculosis (TB), severe acute respiratory syndrome (SARS), West Nile virus, Ebola virus, and other infectious diseases have emerged as global concerns. The rapid movement of people and food products as a result of travel has also created new health problems, such as mad cow disease (bovine spongiform encephalopathy, or BSE) and avian influenza. Globalization has recently changed the lifestyles of developing countries, resulting in new chronic diseases from the importation of high-sodium, high-fat fast foods, along with the more sedentary lifestyles promoted by technologies (e.g., TV, appliances). In addition, in developing countries today, populations are rapidly acquiring chronic diseases (such as heart disease, cancer, stroke, and obesity leading to diabetes), which are adding a double burden of disease given the still challenging acute infectious diseases (Beaglehole & Yach, 2003).

SELECTED GLOBAL INFECTIOUS DISEASES

Tuberculosis

TB remains a high-burden disease. Globally, TB incidence declined from 173 new and relapse cases per 100,000 in 2000 to 140 per 100,000 in 2016. The TB mortality rate among HIV-negative people fell by 39% during the same period. Although millions of people are diagnosed and successfully treated for TB each year, large gaps in case notification persist, and drug-resistant TB continues. In 2016, there were 600,000 new cases of TB that were resistant to rifampicin (the most effective first-line drug) of which 490,000 were multidrug resistant (World Health Organization [WHO], 2018a).

Hepatitis B and C

In 2015, an estimated 325 million people worldwide were living with hepatitis B virus (HBV) or hepatitis C virus (HCV) infection, which causes a risk of slow progression to severe liver disease and death unless timely testing and treatments are provided. Most of the burden of disease due

to HBV infection results from infections acquired before the age of 5. The widespread use of hepatitis B vaccine in infants has considerably reduced the incidence of new chronic HBV infections. Unsafe healthcare procedures and injection-drug use are the major routes of HCV transmission (WHO, 2018a).

Neglected Tropical Diseases

Neglected tropical diseases (NTDs) are a group of diseases characterized by their spread in tropical environments, usually in poverty areas, where multiple infections in a single individual are common. About 1.5 billion people required mass or individual treatment and care for NTDs in 2016, down from 2 billion people in 2010. Progress is occurring; in 2016, diseases eliminated at the country level included lymphatic filariasis in Cambodia, onchocerciasis (river blindness) in Guatemala, and trachoma in Morocco. More than 1 billion people living in middle- and high-income countries still required treatment and care for NTDs (WHO, 2018a).

Cholera

Cholera, an acute diarrheal infection caused by ingestion of food or water contaminated with the bacterium *Vibrio cholera,* is extremely virulent. Cholera has a very short incubation period, between 12 hours and 5 days, and affects all ages. If left untreated, cholera can kill within hours. Cholera remains a serious threat to public health. It is also an indicator of inequality and lack of social and economic development, disproportionately affecting the world's poorest and most vulnerable populations. Cholera transmission is closely linked to inadequate access to clean water and sanitation facilities. Most of the countries that reported locally transmitted cholera cases to WHO during the period 2011–2015 were those in which only a limited proportion of the population had access to basic drinking water and sanitation service. In 2017, the Global Task Force on Cholera Control released a global strategy, Ending Cholera; the strategy is a global roadmap to 2030 and aims to reduce cholera deaths by 90% and eliminate cholera in up to 20 countries. Achieving universal and equitable access to safe drinking water and adequate sanitation and hygiene will be the key long-term interventions in controlling cholera and other waterborne diseases (WHO, 2018a).

Nipah Virus

Nipah virus (NiV) is a zoonotic virus (transmitted from animals to humans) that can also be transmitted through contaminated food or direct contact between people. In infected people, it causes a range of illnesses from asymptomatic infection to acute respiratory illness and fatal encephalitis. The virus can also cause severe disease in animals such as pigs, resulting in significant economic losses for farmers.

Nipah virus (NiV) encephalitis was first reported in Sungai Nipah in Malaysia in 1999 and has emerged as a global public health threat in the Southeast Asia region. From 1998 to 2018, more than 630 cases of NiV human infections were reported. NiV is transmitted from bats to humans or from bats to pigs and then to humans, as well as through human-to-human routes. Deforestation and urbanization of some areas have contributed to greater overlap between

human and bat habitats, resulting in NiV outbreaks. Common symptoms of NiV infection in humans are similar to those of influenza, such as fever and muscle pain; in some cases, inflammation of the brain occurs, leading to encephalitis (Chatta et al., 2018; WHO, 2018c).

The NiV epidemic in May 2018 in Kerala, India killed more than 17 people in 7 days, with high case fatality. The diagnosis of NiV often is not suspected at the time of occurrence, which creates challenges regarding outbreak detection, implementation of timely control measures, and conducting outbreak response activities. Currently, no drugs or vaccines specific for NiV infection have been developed, although this is a priority disease on WHO's agenda (Chatta et al., 2018; WHO, 2018c).

A New Threat

On December 31, 2019, the World Health Organization (WHO) China Country Office was notified of cases of pneumonia of unknown etiology detected in Wuhan, China. In the next 3 days, a total of 44 cases would be identified. Early reports traced the origin to a seafood market in that region. One week later, the causative pathogen was identified as a novel coronavirus, later named COVID-19. The virus can attack lung cells due to their many receptor entries, and the presence of the virus in host cells stimulates a variety of protective responses, causing pneumonia and acute respiratory syndrome (Astuti & Ysrafil, 2020). For this reason, it is also referred to as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2).

By January 13, just two weeks after initial detection, Thailand reported its first case, followed by Japan and South Korea on January 15 and 20, respectively (World Health Organization [WHO], 2020c). By January 22, 2020, WHO issued a statement regarding evidence of human-to-human transmission. One week later, this global health body convened and assessed the limited human-to-human transmission found outside China and officially called the outbreak a Public Health Emergency of International Concern (WHO, 2020d).

On March 11, 2020, there were 113,319 cases of COVID-19 diagnosed worldwide. It had spread to more than 113 countries, resulting in 1,130 confirmed deaths. Because of "the alarming levels of spread and severity and the alarming levels of inactivity," WHO proclaimed COVID-19 a pandemic (WHO, 2020a). The last pandemic, the H1N1 influenza, was in 2009; in retrospect, it was not found to be as severe as COVID-19 appears to be (Centers for Disease Control and Prevention [CDC], 2018).

The Pathogen

COVID-19 is thought to be a highly infectious contagion spread through droplet transmission. The lack of immunity seen worldwide with no treatment or vaccine led to a frenetic race for containment. China shared the genetic sequence of the virus within the first 2 weeks of detection to allow for the development of diagnostic tests and possibly a vaccine. The rapid transmission of the virus quickly overwhelmed both public health and medical systems. We watched as China and Hubei Province quickly pivoted from the containment strategy to community mitigation, and then an expansive quarantine and shelter-in-place. The swift response in China included the building of two separate hospitals in 10 days to accommodate the overwhelming numbers of patients stricken with the illness.

In the few short weeks that ensued, COVID-19 proved to be a formidable enemy. Much was learned about the virus in the coming weeks, including that almost 80% of patients seemed to have mild to moderate symptoms, while up to 20% of people would show severe symptoms requiring hospitalization and often mechanical ventilatory support. The virus appeared to spare children and disproportionately affect the elderly and people with chronic medical conditions (CDC, 2020a). In the first few days of April 2020, WHO (2020b) reported evidence of preasymptomatic and then asymptomatic transmission. This new information further complicated the containment efforts.

The United States Response

The first case of COVID-19 in the United States was thought to be detected on January 21, 2020, related to a case in Wuhan. A test was being developed by the Centers for Disease Control and Prevention, and testing in the country at this time was limited. By January 30, the first case of person-to-person transmission was identified, and on January 31, the president of the United States declared a public health emergency (The White House, 2020). The first federal quarantine in more than 50 years was established for travelers returning from China. The first death in the country was identified on postmortem testing February 6 (Santa Clara County, 2020). At this time, testing continued to be severely limited, and test kits sent from the CDC were found to be flawed.

By mid-March, the United States had more than 1,000 cases of COVID-19. President Trump declared a national emergency and offered guidelines for 15 days of sheltering in place to slow the pace of the virus transmission.

As of May 9, 2020, more than 4.5 million cases of the SARS-CoV-2 novel coronavirus have been detected worldwide, with over 300,000 deaths. More than 1.4 million cases were recorded in the United States by May 10, 2020, with over 86,000 deaths. It is difficult to judge the country's response to the COVID-19 pandemic, but lessons have definitely been learned along the way.

Opportunities and Challenges

Pandemics and threats to global health and security are what public health prepares for every day. It was not a surprise that a respiratory virus would reach pandemic levels and claim the lives of hundreds of thousands of people throughout the world. Experts around the world have felt that a respiratory virus would be the cause of the next pandemic and modeled preparation efforts around a pandemic influenza. We have been tested multiple times in each of our lifetimes for this to happen—from the Middle East respiratory syndrome in 2002–2003 to the H1N1 pandemic in 2009. The very nature of COVID-19, from its respiratory and asymptomatic spread, seems to have been designed to challenge everything that we have prepared for up to this point.

Although we have not yet reached the end of this crisis, barriers in the response have definitely caused delays and led to much-needed time lost. Even before the first case of COVID-19 was identified in the United States on January 21, the United States was working on an effective test for COVID-19 through the CDC. At that time, only limited numbers of public health

labs were performing tests for COVID-19 using stringent screening guidelines and testing only the highest risk patients—even as borders remained open, and air travel continued from other countries fighting mounting battles against COVID-19. On February 28, the United States learned from the CDC about a flaw in the test kits they were working on; the Food and Drug Administration then opened up testing efforts by issuing emergency authorization procedures to commercial companies the next day (CDC, 2020b; U.S. Food and Drug Administration, 2020). By this time, the global effect of the supply chain was inevitably felt. Delays in the ability to procure swabs, reagents, and laboratory results continued to mount. Even at the 3-month mark of the crisis, in some areas of the country, testing delays continue.

The Future

Various areas of the United States are in different stages of reopening at this time, and public health officials continue to fight COVID-19 through identification, isolation, and mitigation efforts. The worldwide economic crisis has put great pressure on reopening the country and even greater pressure on having the necessary public health tools to do so safely. The United States as a whole faces a crisis of outbreaks in nursing homes and various other industries, as it struggles with emerging health disparities. Reports across the United States reveal disproportionately high numbers of African Americans dying from COVID-19, and the CDC reported that more than 80% of hospitalized patients in metro Atlanta were black (Gold et al., 2020; van Dorn et al., 2020).

Public health systems continue to try to keep the disease at manageable levels, although a vaccine or some effective treatment remains beyond their reach at this time. The balance to save lives while supporting an economy trying to reopen has been a difficult one and will continue to be so until significant immunity has been established or an effective vaccine is developed.

GLOBAL NONCOMMUNICABLE DISEASES

In 2016, an estimated 41 million deaths occurred that were due to noncommunicable diseases (NCDs), resulting in 71% of the overall total of 57 million deaths. The majority of such deaths were caused by the four main NCDs: cardiovascular disease (17.9 million deaths, accounting for 44% of all NCD deaths); cancer (9.0 million deaths, 22%); chronic respiratory disease (3.8 million deaths, 9%); and diabetes (1.6 million deaths) (WHO, 2018b).

ROAD TRAFFIC ACCIDENTS

The newly adopted 2030 Agenda for Sustainable Development set a target of halving the global number of deaths and injuries from road traffic crashes by 2020. Without prevention measures, road traffic crashes are predicted to become the seventh leading cause of death by 2030. Road traffic accidents cost most countries 3% of their gross domestic product (GDP). Nearly half of those dying on the world's roads are pedestrians, cyclists, and motorcyclists. Ninety percent of the world's fatalities on the roads occur in low- and middle-income countries, even though these countries have approximately 54% of the world's vehicles. Road traffic injuries are the leading cause of death among people aged between 15 and 29 years (WHO, 2018d).

MALNUTRITION AND OBESITY

Many parts of the world are facing a "double burden" of malnutrition, where undernutrition coexists with overweight and obesity. Obesity in childhood and adolescence is associated with a higher risk of adult obesity and with premature death and disability due to NCDs such as coronary heart disease in adulthood. In addition, obese children can also experience hypertension, diabetes, asthma and other respiratory problems, sleep disorders, liver disease, and psychological problems such as low self-esteem. There has been a global increase in the number of obese children and adolescents aged 5–19 years in the past four decades, from 11 million in 1975 to 124 million in 2016. An additional 213 million were overweight in 2016 but fell below the threshold for obesity. Almost 1 in every 5 children were overweight or obese globally. Although high-income countries continue to have the highest prevalence, the rate at which obesity among children and adolescents aged 5–19 years is increasing is much faster in lower income countries (WHO, 2018b).

ENVIRONMENTAL RISKS

Access to clean fuels and technologies for cooking has slightly improved, and in 2016, the rate reached 59% globally—an increase of 10 percentage points since 2000. In 2018, population growth continued to outpace the use of clean fuels and technologies in many countries, and more than 3 billion people are still cooking with polluting stove and fuel combinations.

Unsafe drinking water, unsafe sanitation, and lack of hygiene also remain important causes of deaths. The WHO African Region suffers a disproportionate burden from such deaths, with a mortality rate 4 times the global rate (WHO, 2018b).

UNINTENTIONAL POISONINGS

Unintentional poisonings caused more than 100,000 deaths in 2016. Although the number of deaths from unintentional poisonings has steadily declined since 2000, mortality rates continue to be relatively high in low-income countries. Unintentional poisoning can be caused by household chemicals, pesticides, kerosene, carbon monoxide, and medicines, or can be the result of environmental contamination or occupational chemical exposure (WHO, 2018b).

MENTAL HEALTH

Almost 8 million deaths by suicide occurred in 2016. Men are 75% more likely than women to die as a result of suicide. Suicide deaths occur in adolescents and adults of all ages.

There is increased awareness of the importance of mental health for global health, largely driven by new data describing the substantial global burden of disease and economic costs associated with mental disorders. The majority of cases are left untreated because of scarcity of services, local barriers to access, and disproportionately low investments in mental health care (WHO, 2018b).

More progress in reducing the global burden of mental disorders will require increased collective, multilateral commitments. The United Nations' (UN's) 2030 Agenda for Sustainable Development Goals now includes mental health within one health-related goal (unlike its

predecessor, the UN's Millennium Development Goals). Significant challenges remain, considering the disease burden and treatment gap, as well as the pervasive stigmatization, discrimination, and human rights violations against those with mental disorders (WHO, 2018b).

GLOBAL OPIOID EPIDEMIC

Opioids are psychoactive substances derived from the opium poppy or their synthetic analogues. Examples are morphine and heroin. An estimated 27 million people suffered from opioid use disorders in 2016. The majority of people dependent on opioids used illicitly cultivated and manufactured heroin, but an increasing proportion used prescription opioids. About 450,000 people died as a result of drug use in 2015. Of those deaths, about 160,000 were directly associated with drug use disorders, and about 118,000 with opioid use disorders (WHO, 2018e).

Overdose deaths contribute to between one-third and one-half of all drug-related deaths, which are attributable, in most cases, to opioids. Lifetime prevalence of overdose among drug users is about 70%. There are effective treatments for opioid dependency, yet less than 10% of people who need such treatment are receiving it. Because of their pharmacological effects, opioids in high doses can cause respiratory depression and death. The inexpensive medication naloxone can completely reverse the effects of opioid overdose and prevent deaths due to opioid overdose (WHO, 2018e).

U.S. OPIOID CRISIS

The United States has been at the forefront of prescription opioid consumption. In 2009, the United States consumed 99% of the world's hydrocodone, 60% of the world's hydromorphone, and 81% of the world's oxycodone.

Many factors contribute to high rates of prescribing, including a lack of consensus regarding the appropriate use and dosing of these medicines, and demand for the products among patients who have opioid dependency or are otherwise abusing or diverting these products. Most of this epidemic is caused by the inappropriate treatment of pain. This is especially true for the management of chronic pain, which affects 1 in 5 adults worldwide, and for which there has been much misunderstanding regarding effective treatments (WHO, 2018e).

More than 100 Americans die from opioid-related overdoses each day. In October 2017, President Donald Trump declared the opioid crisis a national public health emergency. To date, more than 600,000 Americans have died as a result of opioid-related overdoses, and by 2020, this number is expected to surpass 750,000 (Gostin et al., 2017).

Example: The Opioid Crisis in the U.S. State of Georgia

Similar to national trends, deaths related to opioid overdose continue to rise in the state of Georgia in the United States. Recent data from the Georgia Department of Public Health indicate that deaths related to drug overdose are now almost equal to deaths due to motor vehicle crashes. Opioids, primarily prescription pain relievers and heroin, are the main driver of drug overdose deaths (Gostin et al., 2017; National Institutes of Health [NIH], 2018).

The Georgia Department of Public Health reported that from 2010 to 2017, the total number of opioid-related overdose deaths increased by 245%. Starting in 2013, illegal opioids such as heroin and fentanyl resulted in the increase in opioid-related overdose deaths to unprecedented levels. In 2017, a total of 1,620 drug overdose deaths occurred in Georgia, and 1,043 were attributed to opioids. Opioid overdose death rates increased from 4.3 to 10.1 per 100,000 people. Georgia also experienced a 17% increase in heroin-involved overdose deaths and an approximately 53% increase in fentanyl-involved overdose deaths (Gostin et al., 2017; NIH, 2018).

VIOLENCE

Low- and lower middle-income countries often have higher mortality rates as compared with developed countries worldwide. An estimated 477,000 murders occurred globally in 2016, with four-fifths of all homicide victims being male. Men in the WHO Region of the Americas suffered the highest rate of homicide deaths, at 31.8 per 100,000; this was down from 33.5 per 100,000 in 2000 (WHO, 2018f). See Chapter 13 for greater detail on this topic.

GLOBAL LIFE EXPECTANCY

Life expectancy at birth is defined as the length of years, on average, a newborn can expect to live if current death rates do not change. However, the actual age-specific death rate of any particular birth cohort cannot be known in advance. Life expectancy at birth is one of the most frequently used health status indicators. Gains in life expectancy at birth can be attributed to rising living standards, improved lifestyle, and better education, as well as greater access to quality health services. This indicator is measured in years (Infoplease, 2018).

Life expectancy is perhaps the most important measure of health. Life expectancy increases because of healthcare improvements such as the introduction of vaccines, the development of drugs, or positive behavior changes such as reducing smoking or drinking rates. Comparing life expectancies from birth across countries can be problematic. There are differing definitions of live birth versus stillbirth even among more developed countries, and less developed countries often have poor reporting (Infoplease, 2018).

Countries with the Highest Life Expectancy in 2018

1. Hong Kong SAR – 84.3 years
2. Japan – 83.8 years.
3. Italy – 83.5 years.
4. Spain – 83.4 years.

The average global life expectancy at birth was 72.0 years in 2016. Africa is the only continent with 21 nations where the average life expectancy is below 60 years. The lowest life expectancy of all is found in Sierra Leone, with 50.1 years, followed by Angola, Central African Republic, Chad, Ivory Coast, and Lesotho (Infoplease, 2018).

Global Rates for Life and Death Expectancies

Throughout the world there are many variations in life and death expectancies. In general, the world rates are as follows:

1. *World life expectancy rate*: males: 68.09 years, females: 70.24 years.
2. *World birth rate*: 18.9 births per 1,000. The total fertility rate (2014) ranges from 7.35 births per woman in Niger, to 6.57 in Uganda, to 2.22 in Peru.
3. *World death rate*: 7.9 deaths per 1,000. The world range leads in South Africa and Russia, with 17.23 deaths per 1,000 and 16.03 deaths per 1,000, respectively, to the United Arab Emirates and Qatar, with 2.04 deaths per 1,000 and 1.55 deaths per 1,000, respectively.

SUSTAINABLE DEVELOPMENT GOALS

Background

The *Sustainable Development Goals* document developed by the United Nations (2018) is the latest blueprint to achieve a better and more sustainable future for all. The goals address global challenges, including those related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice. The goals interconnect, and to ensure that no one is left behind, it is important that we achieve each goal and target by 2030. World leaders adopted the 2030 Agenda for Sustainable Development, which aims to end poverty, address inequalities, and combat climate change.

Goals

Goal 1: No Poverty

Global poverty rates have been cut by more than half since 2000. Ten percent of people in developing regions are still living with their families on less than $1.90 USD a day, the international poverty line amount. However, millions more make barely more than this (United Nations, 2018).

Goal 2: Zero Hunger and Food Security

Hunger. Globally, 1 in 9 people today (815 million) are undernourished, and the majority of the world's hungry people live in developing countries, where 12.9% of the population is undernourished (United Nations, 2018).

Goal 3: Ensure Healthy Lives and Promote Well-Being for All at All Ages

Ensuring healthy lives and promoting their well-being at all ages is essential to sustainable development for the world's population. Great work has been done in increasing life expectancy and reducing some of the common causes associated with child and maternal mortality. The goal is to have fewer than 70 maternal deaths per 100,000 live births by 2030 (United Nations, 2018).

Child Health. 17,000 fewer children die each day than in 1990, but more than 5 million children still die before their 5th birthday each year. Since 2000, measles vaccines have prevented

nearly 15.6 million deaths, with a greater proportion of child deaths occurring in sub-Saharan Africa (United Nations, 2018).

Maternal Health. Maternal mortality has been reduced by 37% since 2000. In Eastern Asia, Northern Africa, and Southern Asia, maternal mortality has declined by around two-thirds. However, the maternal mortality ratio—the proportion of mothers who do not survive childbirth compared with those who do in developing regions—is still 14 times higher than in the developed regions (United Nations, 2018).

HIV/AIDS, Malaria and Other Diseases. Globally, approximately 36.9 million people were living with HIV in 2017, and 21.7 million HIV-positive people were utilizing antiretroviral therapy in that year. TB remains the leading cause of death among people living with HIV, accounting for 1 in 3 AIDS-related deaths. Greater than 6.2 million malaria deaths have been avoided between 2000 and 2015, primarily in children under 5 years of age in sub-Saharan Africa (United Nations, 2018).

Goal 4: Quality Education

More than 265 million children are not attending school, and 22% of them are of primary school age. Many children who are attending schools are lacking basic skills in reading and math (United Nations, 2018).

Goal 5: Achieve Gender Equality and Empower All Women and Girls

Gender equality is not only a fundamental human right, but also a necessary foundation for a peaceful, prosperous, and sustainable world. Women and girls need equal access to education, health care, decent work, and representation in political and economic decision-making processes (United Nations, 2018).

Goal 6: Ensure Access to Water and Sanitation for All

Clean, accessible water for all is essential. Water scarcity, poor water quality, and inadequate sanitation negatively impact food security, livelihood choices, and educational opportunities for poor families across the world (United Nations, 2018).

Goal 7: Affordable and Clean Energy

Approximately 3 billion people lack access to clean cooking solutions and are exposed to dangerous levels of air pollution. One billion people are functioning without electricity, and 50% of them are found in sub-Saharan Africa alone (United Nations, 2018).

Goal 8: Decent Work and Economic Growth

Fifty percent of the world's population still live on the equivalent of about $2 USD a day, and the global unemployment rate is 5.7%. A continued lack of decent work opportunities, insufficient investments, and underconsumption have led to an erosion of the basic social contract underlying democratic societies: that all must share in progress (United Nations, 2018).

Goal 9: Build Resilient Infrastructure, Promote Sustainable Industrialization and Foster Innovation

Investments in infrastructure such as transport, irrigation, energy, and information and communication technology are crucial to achieving sustainable development and empowering communities in many countries. In addition, manufacturing is an important stimulant for economic development and employment. Basic infrastructure like roads, information and communication technologies, sanitation, electrical power and water very much need to be increased in many developing countries (United Nations, 2018).

Goal 10: Reduce Inequality Within and Among Countries

Economic growth is not sufficient to reduce poverty if it is not inclusive and if it does not involve sustainable development among countries (United Nations, 2018).

Goal 11: Make Cities Inclusive, Safe, Resilient and Sustainable

By 2030, more people will be living within cities. Included with greater urbanization will be congestion, lack of funds to provide basic services, a shortage of adequate housing, a declining infrastructure, and rising air pollution within cities (United Nations, 2018).

Goal 12: Ensure Sustainable Consumption and Production Patterns

Greater resources, energy efficiency, sustainable infrastructures, and providing access to basic services are needed now and will be needed in the future as well (United Nations, 2018).

Water. The world's population must rely on only 0.5% of the world's water and freshwater is needed. Yet, people are polluting water in rivers and lakes faster than nature can recycle and purify it (United Nations, 2018).

Energy. A 32% increase in vehicle ownership is expected by 2020. Households consume 29% of global energy and consequently contribute to 21% of resultant carbon dioxide (CO_2) emissions (United Nations, 2018).

Food. Each year, about one-third of all food ends up rotting in the bins of consumers and retailers or spoiling because of poor transportation and harvesting practices.

Goal 13: Take Urgent Action to Combat Climate Change and Its Impacts

Climate change is now affecting every country on every continent and is disrupting national economies and affecting lives, costing people, communities, and countries (United Nations, 2018).

Goal 14: Conserve and Sustainably Use the Oceans, Seas and Marine Resources

Rainwater, drinking water, weather, climate, much of our food, and oxygen in the air are all ultimately provided and regulated by the sea. Careful management of water and the climate are important for a sustainable future (United Nations, 2018).

Goal 15: Sustainably Manage Forests, Combat Desertification, Halt and Reverse Land Degradation, Halt Biodiversity Loss

Forests, which cover 30.7% of the Earth's surface, provide food, security, and shelter, and are key to combating climate change and protecting biodiversity and the homes of indigenous populations (United Nations, 2018).

Goal 16: Promote Peace, Justice, and Strong Institutions

For greater world peace and inclusive societies, more efficient and transparent regulations need to be established. Challenges to justice systems worldwide are important and significant (United Nations, 2018).

Goal 17: Revitalize the Global Partnership for Sustainable Development

Partnerships between governments and private sectors are needed to build shared goals for the total world population. These include sustainable energy, infrastructure and transport, and information and communications technologies.

GLOBAL HEALTH DISPARITIES

A *health disparity* is a statistically significant difference in health indicators that persists over time. Health disparities are comparative measurements of the burden of disease, as well as morbidity and mortality rates, in specific populations. *Healthcare disparities* are differences in access to appropriate healthcare services by various groups; these differences are due to a multitude of factors but are mainly associated with social inequalities. Disparities in access to quality and timely healthcare services contribute to the disparities in health status. Poorer health status compromises the ability of some groups to obtain timely and appropriate health services. Health and healthcare disparities exist worldwide, affecting both developed and developing countries. In contrast to developed countries, developing nations have a lower level of material well-being based on per capita income, life expectancy, and rate of literacy. These nations are also referred to as "less economically developed," "Third World," "developing," "lower income nations," or "resource-poor countries." In contrast, developed nations are also called "industrialized societies," "advanced economies," and "higher income nations" (King et al., 2013).

INDICES (INDICATORS) OF HEALTH DISPARITIES

Health indicators are quantifiable characteristics of a population that researchers use as supporting evidence for describing the health of a population; they are often used by governments to guide healthcare policy.

1. *Burden of disease*. The impact of a health problem in an area measured by financial cost, mortality, morbidity, or other indicators. It is often quantified in terms of quality-adjusted life-years (QALYs), which allow for comparison of disease burden that is due to various risk factors or diseases. This measurement also makes it possible to predict the possible impact

of health interventions. WHO provides a detailed explanation of how disease burden is measured at local and national levels for various environmental contexts. The global burden of disease is shifting from infectious diseases to noncommunicable diseases—including chronic conditions such as heart disease and stroke, which are now the chief causes of death globally.

2. *Mortality rate*. The number of deaths in a population, scaled to the size of that population, per unit of time. This rate is expressed in units of deaths per 1,000 people per year; thus, a mortality rate of 9.5 in a population of 100,000 would mean 950 deaths per year in that entire population.
3. *Infant mortality rate (IMR)*. The number of deaths of infants (1 year of age or younger) per 1,000 live births. The IMR is a useful indicator of a country's level of health or development.
4. *Morbidity rate*. The number of individuals in poor health during a given time or number who currently have that disease (prevalence rate), scaled to the size of the population. This rate takes into account the state of poor health, the degree or severity of a health condition, and the total number of cases in a particular population during a particular point in time, irrespective of cause.
5. *Life expectancy*. The average number of years of life remaining at a given age or average life span or average length of survival in a specified population; the expected age to be reached before death for a given population in a country, based on the year of birth or other demographic variables.
6. *Birth rate*. The number of childbirths per 100,000 people per year.
7. *Total fertility rate*. The average number of children born to each woman over the course of her life. Fertility rates tend to be higher in developing countries and lower in more economically developed countries.
8. *Disability*. The lack of ability relative to a personal or group standard or spectrum. It may involve physical, sensory, cognitive, or intellectual impairment, or a mental disorder; it may occur during a person's lifetime or be present from birth.
9. *Nutritional status*. A factor influenced by diet, levels of nutrients in the body, and ability to maintain normal metabolic integrity. Body fat may be estimated by measuring skinfold thickness and muscle diameter; levels of vitamins and minerals are measured based on their serum levels, through urine concentration of nutrients and their metabolites, or by testing for specific metabolic responses.

Health Disparities in the United States

Many populations in the United States, whether defined by race, ethnicity, immigrant status, disability, sex, gender, or geography, experience higher rates of certain diseases and more deaths and suffering from them compared with the general population. Although the diversity of the American population is one of the nation's greatest assets, one of its greatest challenges is reducing the profound disparity in health status of its racial and ethnic minorities and rural, low-income, and other underserved populations (NIH, 2018).

Health disparities may be defined more narrowly as persistent gaps between the health status of minorities and nonminorities that continue despite advances in health care and technology. In the United States, ethnic minorities have higher rates of disease, disability, and premature deaths than nonminorities. Compared with nonminority groups, African Americans, Hispanics/Latinos, American Indians and Alaska Natives, Asian Americans, Native Hawaiians, and Pacific Islanders all have higher rates of infant mortality, cardiovascular diseases, diabetes, HIV/AIDS, and cancer, as well as lower rates of immunizations and cancer screenings. Such disparities arise for a number of reasons:

- *Inadequate access to health care*. Caused by economic, geographic, and/or linguistic factors; lack of or decrease in health insurance and education; and poorer quality of health care. A person's ability to access health services has a profound effect on every aspect of his or her health, yet at the start of the decade, almost 1 in 4 Americans do not have a primary care provider (PCP) or health center where they can receive regular medical services. Approximately 1 in 5 Americans (children and adults under age 65) do not have medical insurance. People without medical insurance are more likely to lack a usual source of medical care, such as a PCP, and are more likely to skip routine medical care because of costs, increasing their risk for serious and disabling health conditions. When they do access health services, they are often burdened with large medical bills and out-of-pocket expenses. Access to health services affects a person's health and well-being. Regular and reliable access to health services can:
  1. Prevent disease and disability
  2. Detect and treat illnesses or other health conditions
  3. Increase quality of life
  4. Reduce the likelihood of premature (early) death
  5. Increase life expectancy
- *Substandard quality of care/lower quality of care*. Caused by patient–provider miscommunication, provider discrimination, and stereotyping or prejudice (NIH, 2018).

Global Healthcare Equity

Health equity is the absence of unfair and avoidable or remediable differences in health interventions and outcomes among groups of people. Data that are presented according to social, demographic, economic, or geographical factors can help to identify vulnerable populations and target health policies, programs, and practices. Health equity data provide an evidence base for equity-oriented interventions and are a key component of mainstreaming gender, equity, and human rights, as well as equity-oriented progress toward universal health coverage.

The Health Equity Monitor currently includes reproductive, maternal, newborn, and child health indicators disaggregated by education, economic status, place of residence (rural vs. urban), subnational region, and child's sex (WHO, 2016).

HUMAN RIGHTS TO HEALTH CARE

In order to promote human rights for health care, the following areas need to be addressed.

Access to Health Services

Having both a healthcare provider and medical insurance can prevent illness by improving access to a range of recommended preventive services across the life span—from childhood vaccinations to screening tests for cancer and chronic diseases such as diabetes and heart disease. Having a PCP and medical insurance also plays a vital role in finding health problems in their earliest, most treatable stages and managing a person through the course of the disease. Lacking access to health services, even for just a short period, can lead to poor health outcomes over time.

Services Needed by Children and Adolescents

- Routine checkups during infants' first year can ensure that they are keeping pace with developmental milestones and staying healthy.
- Regular doctor visits can monitor children and adolescents' healthy growth and development.
- Vaccinating children and adolescents on a recommended immunization schedule can protect them from serious diseases, including mumps, tetanus, and chicken pox.
- Screening for overweight and obesity can reduce children's and adolescents' risk of developing diabetes, heart disease, and cancer later in life.

Services Needed for Adults

- Monitoring and managing weight, blood pressure, and cholesterol can reduce adults' risk for developing heart disease and diabetes.
- Routine screening can detect certain cancers, such as breast, colorectal, and skin cancers, at earlier, more treatable stages.
- Screening for and treating sexually transmitted diseases can reduce the risk of serious and long-term health conditions, such as infertility.
- Regular checkups among adults aged 65 years and older can screen for health conditions that develop with age, such as eye diseases and hearing loss.

(WHO, 2017)

UNIVERSAL RIGHT TO HEALTH CARE

The right to health care under international law is the 1948 Universal Declaration of Human Rights ("the Declaration"), which was unanimously accepted by the UN General Assembly as a common standard for the entire world's population. This declaration states that each person has a right to "a standard of living adequate for the health and well-being of himself and his family . . . including medical care and . . . the right to security in the event of . . . sickness, disability . . . or other lack of livelihood in circumstances beyond his control." The Declaration does not define the components of a right to health, but they are included in the statement regarding

medical care. Health is considered to extend beyond health care to include basic preconditions for health, such as potable water and adequate sanitation and nutrition. In addition, the right to health includes freedoms from nonconsensual medical treatment and experimentation (World Health Organization, 1948).

Within the WHO Constitution and the Declaration of Alma-Ata, health-related human rights have been encouraged. The human right to health has been addressed in international law and implemented through domestic law within numerous nations. The Framework Convention on Global Health states that the right to the highest attainable standard of physical and mental health can be a force to enable even the poorest people to benefit from immense health improvements that we know are possible—interventions that are proven and affordable (Gable & Meier, 2013).

Historically, the United States has not wanted to accept international human rights standards or pass the laws necessary to meet them. The United States is currently the only developed country in the world that does not have a plan for universal healthcare coverage and some type of legal right to health care for all its residents ("Here's a Map," 2012).

WHO FIGHTING EBOLA IN THE CONGO

The Ministry of Public Health of the Democratic Republic of the Congo (WHO, 2018g) announced the launch of Ebola vaccinations for high-risk populations in North Kivu province of the country. The vaccinations began just one week after the announcement of a second Ebola outbreak in the country in a year (2018). A total of 44 cases have been reported so far, of which 17 have been confirmed, and work has begun to prepare ring vaccination in the Mangina health area, 30 kilometers from the town of Beni. Dr. Oly Illunga, Minister of Health of the Democratic Republic of the Congo, stated, "Vaccines are an important tool in the fight against Ebola. This is why it has been a priority to move them rapidly into place to begin protecting our health workers and the affected population." A total of 3,220 doses of the rVSV-ZEBOV Ebola vaccine are currently available in the country, while supplementary doses have been requested. While the vaccine goes through the licensing process, an agreement between Gavi, the Vaccine Alliance and Merck, the developer of the vaccine, ensures that additional investigational doses of the vaccine are available. "The Democratic Republic of the Congo has once again demonstrated strong leadership in its early response to this outbreak," said Dr. Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization (WHO, 2018h).

GLOBAL HEALTH WORKFORCE MIGRATIONS (BRAIN DRAIN)

A crisis presently exists in human resources. This is a major global health issue that threatens the quality and sustainability of healthcare systems throughout the world. Healthcare workers currently find many opportunities for employment abroad, and this has led to major migration of workers from low-income countries to higher income countries. Healthcare worker migration has major effects on the countries from which workers migrate (the sending countries), and the receiving countries greatly benefit. The sending countries experience negative effects, such

as shortages in health service capacity, financial loss because of the investment in training and educating the worker and the loss of income taxes paid to governments, decline in morale and commitment among remaining workers, loss of expert knowledge in academic centers, and loss of role models for young students. Donor countries ultimately suffer the most from brain drain.

The gains for recipient countries include relief of shortages of healthcare workers, improved quality of health care, and increased income taxes paid to governments. Some dispute this argument by saying that many healthcare workers eventually return to their native countries and bring back their gains in medical expertise and experience. WHO estimates an undersupply of almost 4.3 million doctors, midwives, nurses, and other healthcare professionals. High-income countries have an average of almost 90 nurses and midwives per 10,000 people, as compared with some low-income countries that have fewer than 2 per 10,000 people (Aluttis et al., 2014). This imbalance results in North America and Europe gaining 65% of healthcare workers yet bearing only 20% of global disease. Africa, in contrast, bears 24% of the health burden with only 3% of the global health workforce (Mackey & Liang, 2013).

SUMMARY

This introduction, which serves as a gateway to the rest of this text, has provided an overall perspective on various global health issues. We defined key terms and offered a brief discussion of global health history, the state of the world population, predictions of global health patterns, population growth issues, equity in accessing health care, emerging health threats, global health indicators, migration of healthcare workers, and global health and its relationship to moral values. Within the following chapters, we further address these and many more issues pertaining to global health.

Study Questions

1. What are some of the major health issues regarding the world population growth?
2. What are some causes of the numerous global health disparities?
3. Why is it necessary for wealthier developed countries to share needed funds and technology to assist with developing countries' major health and healthcare problems?
4. What are the Sustainable Developmental Goals (United Nations, 2018), and why is it important to note their progress worldwide?

Case Study: Unforeseen Costs of Cutting Mosquito Surveillance Budgets

A recent budget proposal to stop the funding for the U.S. Centers for Disease Control and Prevention (CDC) surveillance and research for a mosquito-borne diseases program was found to have the potential to leave a country poorly prepared to handle mosquito-transmitted diseases. Its study showed that decreasing this type of program can significantly increase the management costs of epidemics and total costs of preparedness. The authors' findings demonstrated a justification for the reassessment of a current proposal to slash the budget of the CDC vector-borne diseases program and emphasized the need for improved and sustainable systems for vector-borne disease surveillance.

Case Study Questions

1. What do you think about the CDC making budget cuts for surveillance of and research on countries with mosquito-borne diseases?
2. Is money really saved in the long term for prevention and control of diseases, such as dengue and West Nile virus, by cutting the surveillance budget? What else could be done to save money?

Data from Vazquez-Prokopec, G., Chaves, L., Ritchie, S., Davis, J., & Kitron, U. (2010). Unforseen costs of cutting mosquito surveillance. *Neglected Tropical Diseases, 4*(10), 1–4.

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