H. Russell Searight *Editor*

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Preface

In May 2020, a group of psychologists of the American Psychological Association's Division 52 for International Psychology were initially convened by our chair, Dr. Falu Rami. We were charged with addressing legal and ethical issues related to COVID-19. In particular, we were interested in the international community's response to the pandemic. Our group's members have varying interests which, we soon found, made for a breadth of perspectives. Dr. Rami had a particular interest in how COVID-19 was being addressed in marginalized cosmmunities such as migrant workers and those who were incarcerated. She and her colleagues, Dr. LaShawn Thompson and Dr. Lizette Solis-Cortes, addressed the challenges faced by these populations in addressing COVID-19. Dr. Rami, with a background in both international psychology and family therapy, examined international health-care systems and selected several countries as examples for their response to COVID-19.

Ms. Megan Hall contributed her gift of excellent skills in scientific writing and her thoughtful approach to literature reviews to describe international responses and ethical isssues arising from COVID-19 testing, social distancing and policies regarding face masks. Dr. Karen Brown, with a strong background in international psychology and an interest in advocacy, contributed a chapter addressing those issues. Dr. Laura Dryjanska has published widely in applied social psychology and has a particular interest in addressing the problem of international trafficking. In this volume, Dr. Dryjanska examined the international impact of COVID-19 on mental health, health disparities and role of psychology in educating professinals for advocacy roles. Dr. Peter Battista, with a background in clinical psychology, developed an interest in the international impact of COVID-19 on mental health and how this important issue was being addressed internationally.

The editor and author of several chapters, Dr. Russell Searight, has a background in both clinical psychology and public health. While teaching medical students and family practice residents, he developed an interest in medical ethics which continues and is represented in this volume.

While there is currently a debate about whether the pandemic is over, we believe that COVID-19 highlighted issues that predate its onset, and these include the functioning of health-care systems around the world, the psychological and physical well-being of minorities and marginalized groups, the interface between politics and health, ethical dilemmas, and implementation of preventive health interventions such as vaccination.

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The Death of a Whistleblower

In December 2019, Dr. Li Wenliang (usually referred to as Dr. Li in the Western press), a 34-year-old ophthalmologist in Wuhan, China, encountered several patients exhibiting an unusual form of pneumonia that he thought resembled severe acute respiratory syndrome (SARS). Using the social media platform WeChat, Li informed some of his colleagues and former medical school classmates of the cases he had recently seen (Nie & Elliott, 2020). Several days after issuing a warning, Dr. Li was reprimanded by hospital administrators and summoned to the local Public Security Bureau. He was accused of "rumor mongering" and "publishing untrue statements" (Steensma & Kyle, 2022). At the police station, he was coerced into signing a letter of reprimand. Nie and Elliott (2020) provide this translation of the letter: "We now warn and admonish you about the violation of the law that you committed when you published untrue information on the Internet. Your behavior is out of compliance with what the law allows and violates the rules of the "Public Security Management Regulations of P.R. China. It is illegal conduct. The Public Security Department hopes that you actively cooperate, follow the advice of the People's Police and stop your illegal behavior…" (p. 2). After asking Dr. Li to comply, the admonition continued, "…If you are stubborn so as not to express remorse instead of continuing to carry out illegal behavior, you will be punished by the law. Do you understand clearly?"(Nie & Elliott, 2020). Dr. Li indicated his understanding and signed the document. Soon afterward, Chinese television ran stories criticizing Dr. Li and several other physicians for spreading false rumors.

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The World Health Organization first reported a case of pneumonia of unknown origin in Wuhan on December 31, 2019. Three weeks later, in January 2020, the city of Wuhan was on lockdown. The authorities tightly controlled movement in and out of the city of Wuhan. Social gatherings and events were canceled. At one point, Wuhan citizens were only allowed 30 minutes outside their homes on alternate days. Flights in and out of China were restricted. In the early days of the pandemic, data from China indicated that after imposing a lockdown during the initial outbreak, the infection rate's doubling time increased from 2 days to 4 days (Lau et al., 2020).

Approximately 5 weeks after being detained, Dr. Li died of COVID-19, which he reportedly contracted from an asymptomatic patient. After authorities publicly reported his death at 9:30 pm on February 6, there was a strong public outcry against the government for hiding information about the disease and their insulting, disrespectful treatment of Dr. Li. After the public response, Wuhan Central Hospital released a statement indicating that Dr. Li was not dead. However, he was described as having an infection and in critical condition and was reportedly on ventilator support (Nie & Elliott, 2020). Finally, early on the morning of February 7, a public announcement declared Dr. Li dead for a second time (Nie & Elliott, 2020).

Dr. Li left behind his pregnant wife and a young son (Steensma & Kyle, 2022). Local citizens took to message boards to express gratitude to Dr. Li and to further criticize officials for harassing him. After his death, the Chinese Supreme Court, after reviewing an investigation report, indicated that Dr. Li and his colleagues should not have been charged with initiating rumors (Steensma & Kyle, 2022). In a rare apology for the Chinese government (Associated Press, 2021), the Court stated, "It might have been a fortunate thing if the public had believed the 'rumors' then and started to wear masks and carry out sanitization measures, and avoid the wild animal market" (Steensma & Kyle, 2022, p. 1410). In addition to a public apology to Dr. Li's family, Dr. Li was awarded the official title "martyr," for those who die serving China (Nie & Elliott, 2020).

Coronaviruses: A Brief Overview

Coronaviruses are a family of viruses associated with a range of symptoms. Structurally, the coronavirus is spherical with a "crown" formed by spike proteins. For example, the COVID-19 virus, formally known as SARS-CoV-2, shares a similar structure with SARS-CoV-1, which was responsible for the 2003 outbreak of Severe Acute Respiratory Syndrome (SARS). Although both have similarities to Middle Eastern Respiratory Syndrome(MERS), their genetic differences are relatively small, even though the symptoms in humans associated with each virus can vary.

SARS is believed to have originated in Guandong Province in China in 2002. SARS has an airborne transmission and leads to a flu-like illness that can be severe.

SARS has contributed to nearly 800 deaths worldwide (Centers for Disease Control, 2017). From the perspective of epidemiological history, the SARS outbreak of 2002–03 is significant since it demonstrated how readily a potentially lethal virus could be transmitted through international air travel.

Middle Eastern Respiratory Syndrome MERS initially emerged in 2012 in Saudi Arabia and was soon detected in Egypt. MERS symptoms include fevers, coughs, and respiratory problems. The World Health Organization suggests that MERS has led to approximately 860 deaths. While an animal reservoir for MERS has not been officially established, it is strongly believed to be harbored by Dromedary camels. Direct transmission between humans appears to be more common in healthcare settings. Approximately one-third of patients infected with MERS have died (World Health Organization, 2022).

While there is still some disagreement, many virologists believe that COVID-19, SARS, and MERS all have zoonotic origins. These viruses have been harbored in animal reservoirs and typically do not lead to significant illness in non-humans. However, at some point, these viruses have "jumped" from animals to humans.

COVID-19: Background

As noted above, the etiological agent of COVID-19 is the severe acute respiratory coronavirus 2 (SARS CoV-2). Early clinical symptoms include fever, cough, fatigue, and shortness of breath. These often progress to acute respiratory problems, pneumonia, and organ failure. In addition, the virus disrupts immune functioning and can elicit a significant inflammatory response. In most cases, there is often a substantial increase in inflammatory cytokines, sometimes referred to as a "cytokine storm."

Antibodies to the COVID-19 virus may not be detectable during the first 7 days of symptoms. However, by approximately 2 weeks after onset, antibodies will be present in nearly all cases (Yang et al., 2020). Organ failure may include significant damage to the liver, kidneys, and heart (Yang et al., 2020).

Many patients are estimated to be asymptomatic carriers of the virus. This reality has been a significant obstacle to controlling COVID's spread. Current estimates of COVID-19's incubation period range from 1.8 to 18.87 days, with a mean of 6.57 days (Wu et al., 2022). However, there were reports of patients who had tested positive but were symptom-free for over a month. In the early days of the pandemic, the percentage of asymptomatic carriers was estimated to be between 15% and 30% (Zhao et al., 2020). However, later studies have placed the estimate as high as 80% of laboratory-confirmed cases not exhibiting symptoms (Barboza et al., 2021). A recent meta-analysis also noted a wide range of estimated asymptomatic patients but provided a pooled estimate of 28%–31.4% of persons who tested positive but did not develop clinical symptoms (Alene et al., 2021). Of note, viral shedding occurs in the absence of symptoms—again providing another challenge to COVID-19 identification and containment. The duration of the period of active viral shedding, in which the virus can be transmitted, continues to be studied. Among hospitalized patients with severe COVID symptoms, the duration ranged from 0 to 20 days, with a median of 8 days (van Kampen et al., 2021). With the Omicron variant, the peak has been estimated to be between 2 and 5 days after diagnosis (Takahashi et al., 2022); however, research suggests the overall shedding period for Omicron may be longer (Torjesen, 2022). Knowledge of the duration of this period is relevant for determining the length of time for those testing positive to be isolated.

Estimates of the percentage of deaths among those testing positive for COVID-19 have been wide-ranging. They reflect multiple factors, including clearly establishing a COVID-19 diagnosis, availability of testing linking the COVID diagnosis specifically to the cause of death, the population on which figures are based, and other reporting issues. Case fatality rates are specifically defined and described in a later chapter. The percentage of deaths among those infected with COVID is likely to be underestimated. A recent meta-analysis reported a case fatality rate of 8% in high-income countries compared with 4% in middle-income countries (Abou-Ghayda et al., 2020). An example of a factor determining fatality rates is the disproportionate deaths among residents of long-term care facilities. Nursing home residents are likely to be older and have multiple medical comorbidities. By September 2020, nearly 80% of Canadian deaths related to COVID-19 were associated with long-term care facilities (Dougherty et al., 2021).

As of this writing, the medical community is still learning a good deal about the longer-term outcomes of persons who were either COVID carriers or developed acute symptoms. The presence of significant remaining symptoms after the acute phase of COVID has been termed "long COVID." The definition of "long COVID" typically refers to symptoms that are present 4 weeks after initial infection. At present, the diagnosis of long COVID is a clinical diagnosis. The symptoms are relatively nonspecific, and it is both likely and logical that having had a diagnosis of COVID- either based on testing or symptoms creates an elevated risk for long COVID (Centers for Disease Control, 2020). Prevalence estimates are just beginning to be established, with the Centers for Disease Control reporting 13.3% demonstrating symptoms 1 month after infection and 2.5% at 3 months. Among those with more severe illnesses who were hospitalized, six-month reported prevalence rates of long COVID have been as high as 30% (Centers for Disease Control, 2020). There are suggestions that those who were not vaccinated against COVID and became infected might be at higher risk for longer-term symptoms. It also appears to be more common in those who had more severe symptoms during the episode of acute illness. In the United States, long COVID, also called "post-COVID condition," has recently been recognized as a disability under the Americans with Disabilities Act (Centers for Disease Control, 2020). The symptom picture and risk factors for long COVID are only beginning to emerge.

COVID-19 and International Declines in Life Expectancy

In many countries, COVID-19 has reversed secular trends in longevity dating back to World War II. For example, in Brazil, the lifespan has risen from 59 years in 1970 to 76 years in 2020. In China, the increase in lifespan has been even more dramatic. In 1960, it was slightly under 45 years, with an addition of over 30 years to 76 years by 2020 (Knoema, 2022). In an analysis of changes in life expectancy in 37 countries, 31 countries demonstrated a decline in life expectancy in 2020, coinciding with the pandemic (Islam et al., 2021). The most significant decreases by gender and country were U.S. males, who declined by 2.2 years, and Lithuanian males, with a 1.7-year reduction. In the United States, deaths of those under age 60 were the most significant statistical factor reducing longevity. By contrast, European declines in longevity were mainly due to deaths of those over age 60 (Aburto et al., 2022).

A U.S. study in California (Schwandt et al., 2022) found significant decreases in longevity, with a decline in life expectancy from 81.40 years in 2019 to 79.20 years in 2020 and 78.37 years in 2021. Reductions in longevity among non-Hispanic Whites were 1.9 years, 5.7 years among Hispanics, 3.01 years among non-Hispanic Asians, and 3.8 years among non-Hispanic Blacks (Schwandt et al., 2022).

Internationally, a country's age distribution and population density were found to be factors associated with COVID-19 death rates. It was found that countries with a higher percentage of over-65 residents had higher death rates. A higher mortality rate was also observed in countries with more residents under 15 years old (Gardiner et al., 2021). The latter point is still being investigated. It appears that most transmitted cases begin with adults. However, public health officials during previous pandemics predicted schools would serve as super spreaders (Lewis, 2021). The national prevalence of hypertension, obesity, and, to a lesser extent, diabetes were also risk factors for increased COVID mortality. There was also a role played by the point of implementing infection control measures by a country during the pandemic (Gardiner et al., 2021). No country-wide lockdowns were imposed in Sweden or South Korea, contributing to the higher mortality rate associated with COVID-19. U.S. control measures for COVID-19 were delayed compared to those in many countries (Gardiner et al., 2021). In addition, countries with lower mean outdoor temperatures had higher COVID death rates—perhaps because people spent more time indoors (Gardiner et al., 2021).

Origins of COVID 19: A Current Controversy

As noted above, on December 31, 2019, China's government initially notified the World Health Organization of the appearance of cases of atypical pneumonia in Wuhan Hubei Province. Then, during the first wave of COVID-19, beginning on January 23, 2020, Wuhan initiated an extensive lockdown with minimal traffic in and out of the city. Within several weeks, China established a country-wide emergency response, including requirements for face masks, stay-at-home orders, and reduced inter-city traffic (Feng et al., 2021).

Debate continues about the origins of COVID-19. While there appears to be general agreement that, geographically, the earliest cases were in Wuhan, China, the circumstances surrounding these early cases have elicited controversy. Moreover, the issue of COVID-19‘s origins also has political overtones—particularly in China and the United States.

Most of the scientific community accepts that the early viral cases were linked to the Hunan Seafood Wholesale Market (Worobey et al., 2022). The market was subsequently closed on January 1, 2020. Based on cluster analyses, it has been suggested that the market was the epicenter of Wuhan’s COVID outbreak (Worobey et al., 2022). At least 50% of early cases had direct or indirect connections with the market. Recent analyses suggest two lineages of COVID—however, both appear to be associated with Wuhan’s “wild animal” market (Worobey et al., 2022).

Furthermore, spatial analyses concluded that there were more cases in close geographic proximity to the market than expected by chance (Worobey et al., 2022). One of the arguments against the market being a center for early COVID cases was that a significant proportion of individuals who tested positive did not have any direct or indirect links to the setting. However, geospatial analyses found that those individuals without direct links lived closer to the market in terms of geographic proximity (Worobey et al., 2022). In addition, subsequent cases appeared in relatively densely populated Wuhan areas—particularly neighborhoods with an older population (Worobey et al., 2022).

While some official actions have restricted the game trade, the Chinese government currently permits 54 wild species to be bred on farms and sold for consumption. Some types of wild animals consumed, such as frogs, are relatively inexpensive; others, such as civet, which forms the basis of the delicacy, civet soup, are expensive (Daly & Robinson, 2021). With the government’s encouragement of free markets and the corresponding emergence of China’s middle class, growing trade in “exotic“animals, such as the pangolin, for consumption developed. These exotic species were considered delicacies; consuming them was a sign of financial success. According to Worobey et al. (2022), wild species sold at the Hunan Market included red foxes, hog badgers, and raccoon dogs. These species have been implicated as host reservoirs for the COVID-19 virus. Again, more detailed geospatial studies suggested that persons in closer proximity to the section of the market selling wild game were more likely to test positive for COVID-19.

An alternative account of COVID-19‘s Wuhan origins is the “Laboratory Leak” explanation. Adherents of this view explain that COVID-19 was accidentally released from Wuhan’s Institute of Virology. Another variation on this narrative is that the Chinese government was developing the virus as a biological weapon (Mohapatra, 2022). President Trump periodically referenced the lab leak theory. For example, in an April 30, 2020, press conference, Trump indicated that he had evidence that COVID-19 originated in the Wuhan lab. However, when asked about specifics, Trump responded with, "I can't tell you that; I'm not allowed to tell you that" (BBC News, 2020).

The World Health Organization conducted an inquiry into COVID's origins, released in late 2020. The report indicated that there were no findings to support a laboratory accident. However, the report stated that the likelihood of a zoonotic spillover from an intermediate host was very likely. The Institute of Virology was studying bats as viral hosts. Nevertheless, the report, based mainly upon the work of Chinese scientists, was criticized for having relatively little information about a laboratory accident—only four of the 331-page report discussed that possibility.

China has strongly disavowed the laboratory leak theory indicating that it is Western propaganda, and has even gone as far as to suggest that the virus may have entered China from food imports from foreign countries (Sudworth, 2021). While the virus is known to mutate relatively rapidly, advocates of the lab leak theory point out that the COVID virus variants involved in the pandemic have yet to be isolated specifically in bats or other animals (BBC, 2021). However, closely related genetic variants have been found.

However, by 2021, the "lab leak" explanation appeared to have gained greater respectability (Thacker, 2021). The United States does maintain a scientific presence in China and has collaborated with the Wuhan Virology Institute. In a July 2021 U.S. Congressional hearing, Senator Rand Paul accused Dr. Anthony Fauci, the National Institute of Health and Infectious Diseases Director, of collaborating on "gain of function"research with the Wuhan lab.

Thacker (2021) describes how the lab leak narrative then took an interesting turn into dueling conspiracy theories. Peter Daszak, who oversees EcoHealth, a nonprofit organization that conducts virology research and has sub-contracted studies with the Wuhan Institute of Virology, has been openly critical of a laboratory origin for COVID-19 (Thacker, 2021). In 2020, Daszak wrote a strong editorial labeling the lab leak view adherents as conspiracy theorists. However, many of those who publicly supported Daszak did have ties to his nonprofit corporation. Scientists who were critical of Daszak suggested that Daszak and his colleagues were the "real" conspirators by working to pre-empt an open investigation of alternatives to the "animal market" explanation (Thacker, 2021).

In September 2022, The Lancet Commission, chaired by economist Jeffery Sachs, released a report providing an analysis of the COVID-19 pandemic. The document included reference to the possible "spillover" from the lab—a view that Sachs has supported. However, Sachs has taken the spillover narrative in a slightly different direction, suggesting that COVID-19 may have been accidentally released via U.S. biotechnology. While the Wuhan market as the source of COVID-19 appears to have the most support, controversy continues.

COVID-19 as a Disruptor and Focusing Event

A “disruptor” or “focusing event” can open the door to a radical change in policy (Birkland, 1998). One definition of a focusing event is that it is “… sudden; relatively uncommon; can be reasonably defined as harmful or revealing the possibility of potentially greater future harms; has harms that are concentrated in a particular geographical area or community of interest, and that is known to policymakers and the public simultaneously” (Birkland, 1998, p. 54). These “exogenous events” can become drivers of potential significant policy changes (Birkland, 1998). The existing policy status quo, which typically can only be altered through small steps requiring inordinate amounts of time, is temporarily unsettled, leading to significant shifts when the timing is right. There are various political and economic policies that these events can suddenly challenge. COVID-19, as a global focusing event, rapidly triggered significant policy changes and changes in the practices of established institutions such as business, education, and healthcare.

Birkland (1998), a political scientist, uses weather-related and environmental disasters as examples of prototypic “focusing events.” These crises typically occur suddenly and rapidly escalate. Examples are hurricanes, large-scale flash floods, or ecological disasters like oil spills. COVID-19 certainly fits the definition and elicits the dynamics associated with focusing events. These events also consume public attention and rapidly become “top of the hour” news stories. In a point particularly relevant to COVID-19 and discussed in later chapters in this book, focusing events often lead to identifying previously unrecognized problems. An intense spotlight shines on previously ignored, “under the radar,“festering issues.

Particularly in situations where the official response to the crisis appears lacking, multiple institutions such as law enforcement, healthcare centers and various social safety net agencies such as those providing housing, food, and education may come under the public microscope. Typically, the public’s assessment of these agencies is that they have not responded adequately to the crisis, were not adequately prepared, or may have contributed to it (Birkland, 1998). At the same time, “aggressive blocking action” may be initiated by those, such as government bureaucracies, fearing a challenge to the existing status quo (Birkland, 1998).

An unfortunate example of this pattern is the response to repeated mass shootings in the United States. When one of these tragedies occurs, those in favor of stricter firearm regulations attempt to seize the moment and capitalize on the public’s emotional distress. While expressing great sadness about the loss of life, they point out that a meaningful memorial to the lives lost would be much tighter gun regulation. On the other hand, those in favor of Second Amendment rights, such as the National Rifle Association and their supporters, almost immediately respond to these tragedies by pointing out that access to firearms is not the real issue. Instead, other factors such as inadequate mental healthcare or an unarmed public that cannot adequately defend itself are the real causes.

As discussed at multiple points in this volume, COVID-19 has been a significant focusing event. For example, the pandemic has suddenly overwhelmed existing healthcare capacity, contributed to a significant worldwide economic downturn, and exacerbated pre-existing income inequalities. In addition, COVID-19 has disproportionately impacted minorities, indigenous people, and the disenfranchised, such as persons who are incarcerated.

In a focusing event, government leaders often have to respond quickly and publicly "do something." However, with the COVID-19 pandemic, the availability of recent history as a guide was relatively non-existent. The last major pandemic approaching COVID-19's magnitude occurred in 1918; there are few centenarians around who can provide today's leaders with practical guidance. In addition, government leaders must act without knowing how the situation may resolve—with or without a specific course of action.

Crises serving as the basis for focusing events can be categorized as "creeping," "chronic," or "casting a long shadow" (Boin & t'Hart, 2022). While it seemed to strike suddenly, COVID-19 had some elements of a "creeping crisis." If one considers the history of pandemics in the long term as well as the rise in zoonotic illnesses in the last several decades, the likelihood of a COVID-like event did appear to be on the horizon (Barry, 2004). In most countries, the crisis will be protracted, with the pandemic's effects persisting long after mass vaccinations are completed. Finally, from an economic and mortality perspective, it may also be a "long shadow crisis" with long-term consequences. For example, based on analyses of past financial recessions, some economists suggest that it may take at least a decade to recover from the worldwide upheaval created by the pandemic.

COVID-19 has created worldwide disruption on a scale not previously seen. In 1918, while World War I contributed to the international spread of influenza, the spread was still much slower than the COVID-19 pandemic and SARS. In addition, economies and industries were not as internationalized as today. Because of global interconnectedness, the pandemic disrupted economies in many countries in the global North and Asia simultaneously. Underlying issues included labor shortages, manufacturing slowdowns, and supply chain disruptions. Additionally, because of inadequate numbers of personnel, the movement of goods from warehouse storage to customers was also delayed. One of the hardest-hit industries was air travel, with some countries such as India temporarily only permitting cargo flights and prioritizing medical equipment deliveries.

Healthcare systems have similarly been disrupted. Probably the major rapidly incorporated innovation was distance medicine via the Internet. The rise of telehealth and current evaluative research will be discussed in detail in a later chapter. However, the rapid shift to online healthcare is establishing the types of medical services that can be provided from a distance and those that require face-to-face interaction. It is likely that with the further development of electronically linked healthcare technology, already existing platforms for gathering patients' "real-time" blood pressure, respiratory activity, blood glucose, and temperature from a distance will be significantly expanded.

A Brief, Selective History of Pandemics

For many global citizens, the COVID-19 pandemic was an event without comparison in their lifetimes. However, infectious disease outbreaks and epidemics have a history of over 2000 years. Appreciating the history of contagious diseases provides a valuable perspective on the current pandemic. In addition, many of the challenges presented by COVID-19 are not new.

Historians suggest that the first valid pandemic report comes from around 410 BC. While the symptom picture is not entirely clear, some historians suggest that it was similar to recent influenza. However, based on DNA analysis of dental pulp taken from mass graves, Papagrigorakis et al. (2006) indicate that the DNA sequences point to a variant of typhoid fever. The Athens pandemic resulted in the loss of one-third of the city's population (Longrigg, 1980) and, according to some historians, played a significant role in the decline of classical Greece (Retief & Cilliers, 1998).

In the latter part of the seventh century, monks in England described the pandemic that traveling clergy may have transmitted (Lina, 2008). The "Justinian Plague" from 541–544 CE has been described as leading to the deaths of at least a quarter of Mediterranean Europe; however, some scholars have suggested that it was far less lethal (Mordechai et al., 2019).

In the mid-fourteenth century, The Black Death, a form of plague caused by the bacteria *Yersinia pestis* and carried by rodents, decimated between one-quarter to one-third of Europe's population (Wheelis, 2002). The battle of Caffa in the Crimean region has been described as the first episode of biological warfare. The Mongols, attacking the walled city of Caffa, were ordered by their commander to catapult diseased bodies over the city walls (Wheelis, 2002). It has been suggested that the Black Death led to a more egalitarian European society. Since skilled workers became scarce, they began to command better pay, reducing economic inequality.

The term "influenza"was reportedly first used in the middle of the fourteenth century in Italy to describe the constellation of upper respiratory symptoms (Lina, 2008). A significant number of older people died from the condition. In the early 1400s, an influenza-like disease attributed to a cold wind infected 200,000 people in Paris (Lina, 2008). There are numerous accounts of epidemics that initially came from Asia and then spread to Europe during the late 1500s. Waves of influenza are reported for multiple periods in the sixteenth and eighteenth centuries. Pre-enlightenment science explanations prevailed into the 1700s and included the view that specific alignments of the stars impact human health. There are early accounts of influenza in North America in the late 1700s, and by 1790 the disease was relatively well established in North America, affecting George Washington (Lina, 2008).

From 1889 to 1891, three successive influenza waves circulated worldwide, and periodic outbreaks occurred in the ensuing decade. In 1900–1901, an influenza outbreak was responsible for increased mortality in England and the east coast of North America. However, in 1918, with the Spanish flu, influenza's power became apparent (it is not believed that the flu originated in Spain, but historians have suggested that the Spanish press was more open about the condition relative to other countries during wartime). The large-scale virus transmission was enabled by the international movement of soldiers during World War I. The Spanish flu, the "The Great Influenza Pandemic of 1918," was believed to have killed between 40 and 50 million people worldwide (Barry, 2020). It has been said that more World War I soldiers died from the flu than in combat (Barry, 2020). As discussed below, during the COVID-19 pandemic, the Great Influenza pandemic was a reference point for contemporary public health professionals, policymakers, and epidemiologists (Lewis, 2021).

By the early twentieth century, an appreciation of contagious illness had developed. As a result, during the 1918 pandemic, public health authorities and municipal governments imposed face mask requirements, social distancing guidelines, and quarantine. While social theories of illness transmission and accompanying interventions at that time were not radically dissimilar from today, the disease etiology was not well understood.

In 1892, the German bacteriologist Richard Pfeiffer announced that he had discovered the cause of influenza, a bacillus (*Bacillus influenza*), that came to be known now as Pfeiffer's Bacillus (Barry, 2020; Eyler, 2010). The role of Pfeifer's Bacillus as a cause of influenza was a controversial issue in medicine and epidemiology until approximately 1920 (Eyler, 2010; Van Epps, 2006). Multiple vaccines were also developed and tested for influenza during this time (Eyler, 2010). However, there were no clear standards to determine if a vaccine was effective. Recent advances in medical technology suggest the 1918 influenza virus was of the H1N1 strain.

Because of their population density, schools were believed by many public health officials to be a potential source of contagion during the 1918 pandemic. Municipalities varied in school closings, with the average number of days being 36 (Ager et al., 2020). Similar to the controversies surrounding COVID-19 school closures, public health officials' recommendations in 1918 sometimes triggered antagonistic responses. In Minneapolis, the local health department ordered the schools to be closed, but the superintendent and school board did not comply (Ager et al., 2020). However, some large cities such as New York and Chicago never closed their schools. In New York City, one of the arguments for keeping schools open was that children were better protected by attending school than spending their days in crowded tenements (Ager et al., 2020). Chicago officials indicated that keeping schools open prevented children from spending their days roaming the streets (Ager et al., 2020).

Polio was a condition that seemed to have a seasonal pattern of outbreaks. In the 1930s and 1940s, polio occurred in various parts of the United States each summer. However, in the late 1940s and early 1950s, polio cases were particularly plentiful and severe, and outbreaks were frequently publicized (Oshinsky, 2005). While polio had varying degrees of severity, some individuals developed paralysis of the legs and, less commonly, of the diaphragm. With paralysis of the diaphragmatic muscles, breathing became very difficult. As a result, it was necessary to place the patient in a large machine, the iron lung, which was an early form of mechanical ventilation (Oshinsky, 2005). President Franklin Roosevelt was infected with the virus as an adult, probably while swimming, and experienced significant paralysis of his legs throughout the remainder of his lifetime.

While the exact mode of polio's transmission was not initially known, the seasonal pattern suggested that the disease was probably contagious and led to the closure of many public swimming pools. Eventually, it was determined that polio was transmitted through waterborne fecal material and droplets of saliva in the air. With the support of Roosevelt (who some now believe may not have been afflicted with polio but with Guillain–Barré Syndrome), large-scale public fundraising campaigns for preventing polio and centers for treating patients emerged. In the United States, the efforts of the National Foundation for Infant Paralysis (better known as the March of Dimes) raised substantial amounts of funding through charity balls. Some of these events included celebrities (Larsen, 2012). Historically, these efforts represented one of the first large-scale coordinated public fundraising programs for a specific illness in the United States.

In the mid-1970s, two cases of an influenza virus (at the time, labeled "A/New Jersey/76") were reported at Fort Dix, New Jersey. One soldier died, 13 were hospitalized, and 230 tested positive for the strain (Lessler et al. 2007). Two of the early cases had had recent contact with pigs. After reviewing information, the United States Public Health Service concluded that what came to be known as H1N1 swine flu was transmissible between humans. At particular risk were persons under age 50 who had not been alive during the 1918 epidemic and had not developed antibodies to the condition (Wright, 2021). There was concern about a large-scale swine flu epidemic affecting the United States. As a result, President Ford approved a national vaccination campaign. There were two known deaths from H1N1 swine flu and a possible 25 deaths associated with the vaccine (Wright, 2021).

However, zoonoses, conditions in which a virus "jumps" from animals to humans, became an increasing concern. HIV 1 and HIV 2, the viruses causing Acquired Immune Deficiency Syndrome (AIDS), were first recognized in the 1980s. Both strains of HIV have been found in chimpanzees, and the earliest cases of the condition appear to have arisen in Central Africa (Sharp & Hahn, 2011). HIV is transmitted primarily through sexual contact, but HIV may also arise from exposure to blood from an infected person. While the initial reports of the condition in the United States focused on men with same-sex sexual partners, it also became apparent that the virus was transmitted from sharing unsanitized intravenous needles, heterosexual contact, and blood transfusions. According to the World Health Organization (2022), in 2021, 38.4 million people worldwide lived with HIV, 1.5 million acquired the condition, and 650,000 died from HIV-related causes.

The 1918 Influenza Epidemic has since been linked to an H1N1 virus from birds. There have been several outbreaks since that time. The so-called "Asian flu," caused by the H2N2 virus, was first reported in Singapore and Hong Kong in 1957. The resulting death toll was estimated at 1.1 million worldwide, with 116,00 attributed to deaths in the United States. An outbreak in 1968, the H2N2 virus was responsible for the deaths of 1 million people with approximately 100,000 deaths in the United States. In 1997, the H5N1 influenza virus—bird flu—first appeared in Hong Kong.

It reemerged in 2003, and it was estimated that between 2003 and 2017, of the 2342 people infected, 1053 died (Barry, 2020).

The 2009 H1N1 swine flu epidemic was responsible for an estimated 150,000–570,000 deaths worldwide, with approximately 12,000 US deaths. Demographically, victims of the H1N1 flu virus were significantly younger than the average age of those who died of seasonal influenza, in which most of the mortality occurs in persons above 65 (Barry, 2020). One of the difficulties in combating the influenza virus and other newly emerging viruses is that they mutate rapidly. Therefore, the specific antibiotic effective with one strain may not be as effective with another. This variability is currently an issue with COVID-19. As omicron and related strains appear, the efficacy and durability of COVID vaccination are not entirely clear.

In 2003, the first cases of the severe acute respiratory syndrome (SARS) were reported (Wong & Leung, 2007). SARS was traced to a coronavirus in animals that migrated to humans via China's "wet markets," where exotic animals are often sold (Peiris et al., 2004). SARS originally appeared in China in 2002 and rapidly spread to over 30 countries via air travel. Within 6 months, 700 people died, and at least 8000 were infected (Wong & Leung, 2007).

President George W. Bush was encouraged to read Barry's (2004) account of the 1918 influenza epidemic by one of his advisors. After doing so, a White House task force was convened to develop a plan for a possible U.S. outbreak. In addition to Barry's (2004) account of the pandemic, Bush had been aware of a new strain of avian-born influenza virus detected in Asia (Lewis, 2021) and wanted to be prepared for a potential U.S. outbreak. As a result, the National Strategy for Pandemic Influenza was released in November 2005. Three fundamental principles guided the national strategy: (1) stopping, slowing, or otherwise limiting the spread of a pandemic to the United States; (2) limiting the domestic spread of a pandemic and mitigating disease, suffering, and death; and (3) sustaining the infrastructure and reducing the negative impact to the economy and the functioning of society (Presidents Letter, November 1, 2005).

Lewis's (2021) account of policy development suggested considerable disagreement between the experts involved. The Centers for Disease Control were generally taking a relatively conservative stance toward disruptions in school, employment, or business activities. While some epidemiologists and public health officials had modeled a pandemic and the interventions that could prevent the spread of a viral illness, one of their top recommendations—school closures—was not well received by others in the committee, including representatives of the Centers for Disease Control. Officials and some influenza historians disagreed with the concept of school closures and the prevention of church services and public meetings, pointing out that they were not effective in Philadelphia in 1918. However, these policies were not implemented in the Philadelphia outbreak of 1918 until relatively late in the city's epidemic. School closures did occur in St Louis, which subsequently had fewer influenza cases than Philadelphia. During the COVID-19 pandemic, this historical finding was pointed out to those who were critical of recommendations for school and business closures as a standard for any future U.S. pandemic (Lewis, 2021).

In the past 50 years in the United States and most countries in the Global North, conditions such as measles and diphtheria have been under control and are generally infrequent. However, there are isolated outbreaks. For example, attacks such as the "Disneyland" measles outbreaks in California in 2014–2015 resulted in 147 cases of the condition (Sundaram et al., 2019). In addition, these episodes of emerging infectious disease have been associated with regions or communities with lower vaccination rates (Sundaram et al., 2019).

Conclusion

COVID-19 is the most recent of a series of zoonoses—viruses existing in animal reservoirs that jump to humans. The airborne transmission of the virus in an urbanized society with rapid global interconnections has quickly led COVID to become a worldwide public health crisis. However, infectious illness does not exist in a vacuum involving health alone and impacts individual work, education, and social lives. Additionally, COVID-19 is still, to some extent, an unknown entity, and the duration of immunity—either through contracting the condition or vaccination—is only beginning to be understood. It does appear, however, that, unlike measles, mumps, and scarlet fever, in which vaccination provides long-standing protection, COVID will require repeated immunizations. The apparent time-limited protection provided by the COVID vaccine and the new forms that the virus will take mean that regular COVID immunizations will be part of our lives, similar to our annual flu shots.

The precautions associated with the pandemic—quarantine, mask wearing, and social distancing—have been successfully employed in reducing the impact of previous infectious outbreaks. Vaccination as a form of protection, while well-established, has also become controversial. Vaccination, now politicized, has also been intermittently debated for well over a century. As a major crisis, COVID has highlighted a number of pre-existing social problems that have influenced response to the pandemic. While there will undoubtedly be long-term residual changes in healthcare, the work environment, and education, resulting from COVID-related disruption, it remains to be seen whether these changes will be beneficial.

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Chapter 2
The Pre-existing Conditions Influencing COVID-19's Impact

H. Russell Searight

Introduction

COVID-19's relatively abrupt onset highlighted many pre-existing issues that influenced the response to the pandemic and, in many countries, contributed to significant controversies around the condition's existence, the role of testing, vaccines, and public health measures designed to reduce transmissibility. The term "diathesis" typically refers to the individual predisposition for illness. COVID-19 was superimposed on multiple social and political diatheses—many of which had developed over the past 30 years. These pre-existing factors included growing income inequality, access to quality health care, the rise of populist movements in many countries, associated conspiracy theories, and racism.

The Social Determinants of Health

Social Epidemiology

Instead of examining bacteria, viruses, or airborne particulates in the microenvironment, social epidemiology examines the macroenvironment's risk factors. In social epidemiology, structural factors contribute to health and illness. For example, public health recognizes discrimination, residential segregation, hyper-incarceration, and food insecurity as illness exposures. In the 1800s, the developing fields of epidemiology and public health targeted social and environmental determinants

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(Jeffries & Henny, 2019). For example, John Snow, often considered the founder of epidemiology, established an association between cholera and residential proximity to London's Broad Street water pump (Johnson, 2006). Likewise, Virchow described the relationship between typhus mortality and social class—particularly the disproportionate number of typhus deaths in the lower-income regions of Upper Silesia (Brown & Fe, 2006).

Du Bois (1899), whom some consider social epidemiology's originator, challenged the prevailing view that mortality differences between Blacks and Whites were primarily attributable to genetic factors (White, 2011). Instead, his analyses concluded that racial disparities in mortality would disappear if social and economic conditions were equalized (Du Bois, 1899). With the rise of germ theory in the early twentieth century, attention to social conditions as etiological factors in health and illness waned (Berkman et al., 2014). However, beginning in the 1980s, with the rise of systems models and the biopsychosocial perspective in medicine (Engel, 1977), increased attention was again devoted to the social determinants of health.

Studying morbidity and mortality among a longitudinal cohort within the British civil service, Marmot's (2015) Whitehall study provides a wealth of information about subtle differences in job ranking and their association with morbidity and mortality. Inequality in job ranking exhibited a dose–response relationship with health status. Employees of a given rank had better health than the job classification immediately below and worse health than those immediately above (Marmot et al., 1991). In attempting to explain this pattern, later Whitehall studies examined the association between job characteristics and health. Among a large sample of female civil servants, workplace roles involving high demand and an imbalance in effort to reward were associated with a greater risk of mental health conditions (Stansfield, 2000).

In the Global North, the geographic juxtaposition of unfavorable social conditions and detrimental health have graphically conveyed pronounced inequalities. For example, in the U.S. city of Chicago, a short walk is associated with a substantial decline in life expectancy. As Ansell (2021) points out, "You can walk the half mile from Hyde Park to Washington Park and watch 14 years of life evaporate" (p. 36). In 2010, the Hyde Park neighborhood had an average expectancy of 83 years, while the comparable Washington Park had an average life expectancy of 69. Similarly, in New Orleans, a 3 1/2 mile bicycle ride is associated with 25 years of lost life; life expectancy in the Navarra neighborhood was 80 years; however, upon entering the French Quarter, the average lifespan drops to 55 years (Ansell, 2021).

The field of social epidemiology has also been creative in devising quantitative measures of disease and health risks. In 2016, opiate use (illness) and voting patterns in the United States (risk exposure) were studied. According to Medicare claims data, counties with heavier opioid use were more likely to support Donald Trump in the 2016 election (Goodwin et al., 2018). Compared with counties with fewer opioid prescriptions, regions with greater opiate use cast more votes for the Republican candidate. In addition, other data suggested that alcohol and suicide-related mortality rates were higher in counties that voted for the 2016 Republican presidential candidate. According to Gallup data, supporters of President Trump were more likely to reside in counties with lower living standards and fewer opportunities for upward mobility. A more detailed analysis revealed that support for the Republican candidate accounted for 18% of the variance in opioid use in these counties (Goodwin et al., 2018).

Income Inequality

Income is one of the most powerful social determinants of physical and mental health. COVID-19's onset coincided with a pre-existing pattern of growing income inequality in the Global North. With the demise and shrinking of the middle class, countries such as the United States became financially dichotomized with concentrations of high and low-income segments of the population.

Multiple indices have been used to reflect income inequality as an illness exposure. Probably the most commonly used statistic is the Gini coefficient. The Gini coefficient is based upon the Lorenz curve. Lorenz curves show the cumulative percentage of income earned by the population based on total economic revenue and total income per capita (De Maio, 2007). In an economically equal society, the Lorenz curve would follow the 45° line of equality if the poorest 25% earned 25% of the total income while the poorest 50% earned 50%. Inequality causes the Lorenz curve to deviate from the 45-degree line of equality. It is possible that the "poorest" 20% of the population may earn 5% of the total income; the "poorest" 50% of the population may reach 20% of the total income, and the wealthiest 1% may earn 60% of the total income (De Maio, 2007).

While income inequality generally increases internationally, there are national variations in historical patterns (Jolly, 2007). Historically, the overall trend in income distribution is in the direction of greater inequality. From the 1820s through the early 1990s, the worldwide Gini coefficient increased from 0.5 to 0.67, with corresponding income per capita income gaps increasing between the highest 5% and lowest 20% of the world's population (Jolly, 2007). Income inequality in the United States increased during the second half of the nineteenth century, declined through most of the twentieth century, and then increased again during the 1970s. As a result, the disparity has become even more significant since then. The United Kingdom followed a somewhat similar pattern. The situation changed, however, from the late 1970s to the early 1980s (Jolly, 2007). Over the last 20 years, inequality in the United Kingdom has risen significantly and more rapidly than in any other OECD country. Scandinavian countries historically have had less pronounced income inequality. While Scandinavia showed some increase in economic disparity from 1850 to 1900, the twentieth century witnessed a gradual and steady decline in economic inequality countries such as Norway and Sweden.

Over the past 30 years in Asia, a close relationship between educational disparity and income inequality has developed. For example, Park's (2020) examination of economic data from 1990 through 2020 found that income disparities were reduced in Asian countries with an overall higher education level. However, income inequality has increased in Asian countries, with more significant educational disparities among the population (Park, 2020).

As a social determinant, income inequality shows moderate to strong associations with a country's health status. When the pandemic began, income inequality was well-established in the Global North. Using the Gini index, the U.S. states with greater income inequality demonstrated more COVID-19 deaths. This pattern was also present in Canada. However, social determinants associated with health go beyond income. Living in quality housing with plumbing, a hygienic sewage system, and clean water, while intertwined with income, does demonstrate an association with better health. For example, affordable housing and neighborhood safety were associated with COVID infection rates in the United Kingdom, the United States (Morante-Garcia et al., 2022), and Canada. In examining temporal patterns of COVID-19 onset, it was found that in Italy, the United Kingdom, Iran, and the United States, the role of social determinants became more evident after the first 6 months of the pandemic. By that time, it was clear that the virus disproportionately impacted ethnic minorities, women, and lower socioeconomic groups (Green et al., 2021). Social determinants in COVID more powerfully impacted the number of COVID-19 cases compared with COVID-19 mortality rates (Green et al., 2021).

Among some migrant groups, economic hardship is likely to cluster together with living conditions. In regions with the lowest incomes, the COVID-19 infection rate was 2½ times higher than those in the highest income group. When comparing regional cases in Almeria in Southern Spain, among Moroccans and Sub-Saharan African immigrants, COVID-19 rates were significantly higher than among non-immigrants (Morante-Gracia et al., 2022). In a sample of Moroccan settlers in the region, the prevalence rate of testing positive for COVID-19 was 26.2%. Many small informal settlements were comprised of shacks without essential running water, garbage collection, or sewers. While inadequate income was associated with COVID, the absence of running water in the home strongly predicted infection. In addition, in many of these settlements, the population density in homes was high—making social distancing difficult (Morante-Garcia et al., 2022).

Australia also has a large immigrant population, with close to 30% of the country's total population born outside of the country. In recent years, Australia has hosted refugees from Syria, Afghanistan, and sub-Saharan Africa. As in other countries, pre-existing social determinants such as income and comorbid health conditions appear to elevate COVID risk. A recent study found that those in Australia at most significant risk for contracting COVID-19 were immigrant men, dependent on state support for income, and those with drug and alcohol problems (O'Mara et al., 2021)

In Brazil, socioeconomic disparity within certain municipalities was associated with higher maternal mortality rates related to social determinants. For example, "Precarious urban infrastructure," such as living in an area with an inconsistent water supply and inadequate sewage, was associated with higher maternal death rates (Siqueira et al., 2021). The onset of COVID-19 further exacerbated these mortality rates.

After remaining stable for about 15 years, U.S. firearm deaths began increasing in 2015 (Goldstick et al., 2019). In the United States, firearm-related deaths appear to have been influenced by COVID-19. COVID-19's accompanying lifestyle changes appear to have interacted with poverty and other health risks. The U.S. Centers for Disease Control indicated that firearm-related homicide rates increased by 30% during the first year of the COVID-19 pandemic. The firearm homicide rate per 100,000 rose from 4.6 in 2019 to 6.1 in 2020—the highest rate since 1994 (Houry et al., 2022). Communities disproportionately affected by poverty, systemic inequity, and structural racism incurred the heaviest loss of life due to rising gun violence. Poverty appeared to be a key driver of increased firearm violence and growing community disparities. Areas with the highest poverty rates experienced the most significant loss of life from both gun-related homicides and suicides.

Deaths of Despair and the Opiate Epidemic

In the United States, the COVID-19 pandemic was superimposed upon a pre-existing epidemic—often labeled "deaths of despair "(King et al., 2022). Deaths of despair refer to mortality associated with substance abuse, suicide, and in some instances, cardiovascular disease (Case & Deaton, 2020). While critics have argued that Case and Deaton's (2020) model lumps together multiple conditions and indicates a common cause, Case and Deaton's explanation and related term "deaths of despair" has received much public attention and research. Before the onset of COVID-19, the U.S. life expectancy was 77.3 years—2 years shorter than other countries in the Organization for Economic Cooperation and Development (OECD) (World Bank, 2021). However, by 2015, life expectancy in the United States had stopped increasing (Case & Deaton, 2020; King et al., 2022). This cessation disrupted a pattern that began in the early 1950s when the average American's lifespan increased annually.

In their explanation of this pattern, Case and Deaton (2020) argue that multiple factors have led to a loss of dignity, meaning, and sense of confidence among some segments of U.S. society. In particular, these deaths appear to be over-represented among middle-aged White males without a college education (Metzl, 2019). Case and Deaton (2020) invoke social determinants such as moving from an industrial production economy to an information-driven economy. Other factors include unemployment or underemployment with corresponding reductions in wages and benefits such as health insurance which in turn creates significant family conflict, often resulting in divorce or separation. Loss of regular employment often leads to the disintegration of one's identity and accompanying sense of self-worth (King et al., 2022).

Historically, a similar process has been described in Eastern Europe and the former Soviet Union in the 1990s (King et al., 2022). Multiple studies have demonstrated the association between changes in an industrial economy to a free market model on health in former Eastern Europe and Russia. In the former Soviet Union, a notable lifespan reduction was associated with the abrupt transition from a socialist/communist economy to a free market system (King et al., 2022). Detailed analyses of the factors related to this pattern of mortality occurring 7 years earlier than in the Soviet era found that middle-aged men were responsible for most of this longevity decline. Specifically, men employed in industry and consuming excess alcohol accounted for a disproportionate number of these early deaths (King et al., 2022). The current pattern of deaths in the United States has been characterized as analogous to Russia's reduced longevity with middle-aged males, unemployment, and alcohol use in both countries (King et al., 2022).

In the United States, the decline in industrialization also contributed to the decrease in the power of unions to maintain workers' jobs and negotiate for quality health insurance and safe working conditions (Case & Deaton, 2020). The available positions for those who had been industrial workers were often unskilled jobs in the service industry. Many of these positions are part-time (partly so that employers were not required to provide health insurance), temporary, and poorly paid. With the decline in wages associated with factory closings, many displaced workers often needed to hold down several of these part-time positions for economic survival. Some observers suggest that this need to work multiple jobs and unpredictable shifts contributed to the increased use of the stimulant methamphetamine (Reding, 2010).

However, in addition to alcohol, deaths of despair were seen as driven by increased opioid use. The 1990s witnessed a rise in opioid prescriptions in the United States. At that time, there was concern that physicians were not adequately treating patients' pain. As a result, pain became the "fifth vital sign" (along with body temperature, heart rate, blood pressure, and pulse rate)—albeit a more subjective indicator than the four others (Chidgey et al., 2019). Purdue Pharma, the maker of Oxycontin, the most prescribed form of oxycodone, carried out an aggressive marketing campaign with physicians and provided patients with discounts for their initial prescriptions (Van Zee, 2009). In addition to its efficacy in treating pain, Purdue Pharma's representatives described the drug as having minimal addictive properties (Van Zee, 2009). Consistent with the role of opiates in "deaths of despair," Purdue Pharma's OxyContin and other opiates were disproportionately prescribed for Whites (King et al., 2022).

As the harm associated with these previously-seen-as-benign opiates became more apparent, state regulators exerted greater oversight of physicians' prescribing practices and developed monitoring programs for opioid prescriptions (Bao et al., 2016). Many patients underwent drug withdrawal as physicians began reducing their prescriptions for opioids. For many patients, being cut off from prescription opiates that they had taken for years, along with the typical move from a gateway drug to a more severe drug with potential for harm, the solution was to substitute heroin. Muhuri et al. (2013) found that 80% of heroin users had misused prescription narcotics earlier. To increase the economic return on heroin and, in some instances, to address heroin's increasingly limited supply, heroin was often "packaged" together with the drug fentanyl. One of the practical issues with fentanyl was that persons using heroin consistently knew how to dose the drug while they did not know the level of fentanyl that could become lethal.

King and colleagues (2022) note that other countries, such as the United Kingdom and Canada, are also experiencing increased deaths of despair but not of the same magnitude as in the United States. One key difference between the United States and these countries is the availability of universal health care and a more extended network of social support services-both of which are less accessible in the U.S. (Dutton, 2021).

There is some evidence that deaths of despair increased during the COVID-19 pandemic and evidence continues to accumulate. Increased social isolation coupled with increased unemployment have been implicated as possible factors in an increase in deaths of despair during the pandemic. A recent demographic analysis, not surprisingly, found an increase in U.S. deaths in 2020—much of it due to COVID-19—while other common causes of death were relatively stable. Even with this pattern taken into account, mortality was higher than expected. Mulligan (2021) suggests that these deaths are more likely due to factors associated with despair and not simply uncounted COVID-19 deaths. A study conducted in San Francisco emergency departments did demonstrate that during the same month in previous years and also when compared with the months immediately before the pandemic, overdose deaths per day in 2020 were higher than previously (Appa et al., 2021).

Health's Social Determinants: Ethical Implications

Despite the greater attention to public health ethics created by the COVID-19 pandemic, ethical theory development at the population level lags behind the analysis of individually focused health care issues such as informed consent, organ transplantation, and death with dignity. In responding to health's social determinants, the ethical dimension of justice is central (Rawls, 2004; Ruger, 2004). A just approach requires a substantial reduction in socioeconomic disparities and an agreement about a fundamentally acceptable minimum standard of living (Daniels, 2000).

Ethical analyses of health's social determinants open the door to many intellectually ambitious and cognitively taxing moral dilemmas. One challenge is defining the relevant domain for ethical decision-making. What is the moral obligation of a citizen of the Global North to their counterpart in the Global South (Goldberg, 2017)? For example, Goldberg (2017) notes that the life expectancy in Sweden is 82 years, while the life expectancy in Sierra Leone is 45 years. Does this 37-year difference in lifespan obligate the long-lived to devote resources to improve the lifespan of their less fortunate fellow global citizens? As discussed further in the chapter on vaccines, the World Health Organization suggests that economically better-off countries should contribute to reducing these international differences and establishing a baseline of global health. Even within a country or city, is there a moral duty and accompanying action to correct the differences in lifespan separated by a county zip code?

Social epidemiologists such as Marmot (2015) de-emphasize individual-level responsibility for health while arguing that the more potent vector of disease is the environment in which we work and live. The social determinants themselves do not act independently. Beginning with fetal development, factors such as income and environmental exposures are already influencing future health status. One of the more powerful forces for reducing health disparities is not the geographic availability of a clinic or hospital but access to quality education. Early childhood education is a relatively low-cost, high-yield intervention associated with later physical and mental health and economic well-being (Campbell et al., 2012). It is also well established that one of the most potent interventions for improving the health of women and girls living in the Global South is being able to attend school (Desai & Alva, 1998 Manandhar et al., 2018). While these factors are powerful predictors of health, they are often not considered part of public health.

As noted above, income inequality demonstrates a strong association with lifespan. While there are multiple theoretical and economic analyses of income support programs, evidence of their impact on meaningful outcomes such as mortality, chronic illness, psychiatric conditions, and education is relatively sparse. Guidelines for conducting these studies are being developed (Johnson et al., 2022). The pandemic has led to national short-term income support programs, for which the impact is still being determined. In Australia, COVID-related income support for those unemployed was associated with reduced psychological distress (Botha et al., 2022). Supporting the significance of income on early neurocognitive development, Troller-Renfree et al. (2022) found that mothers receiving income support had infants who demonstrated a distinct pattern of EEG activity not seen when income support was absent.

In sum, the perspective of the social determinants is promising for reducing health disparities. However, macro system changes in governmental policy, education, the workplace, and the physical environment are necessary to achieve the ethical goal of health justice.

The Rise of Populism and National Divisions

The Populist Message

The international influence of political populism was influential in many national governments' responses to the pandemic. For example, in the United States, the 2020 election featured the politicization of pandemic countermeasures such as social distancing and wearing masks while debating the seriousness of COVID-19. However, the United States is certainly not alone, with significant populist movements having developed in multiple countries, including Honduras, Brazil, Hungary, the Philippines, and South Africa (Ringe & Renno, 2023).

Populism is defined in various ways, and many argue that it is a nonspecific concept. Mansbridge and Macedo (2019) describe critical elements that they view as characterizing populism. Populism's foundation is the presence of politicians who represent "the people." The phrase "the people" refers to "ordinary" and "common" people who are morally upright citizens in contrast to the "elite," who are morally suspect and often viewed as corrupt (Mansbridge & Mancedo, 2019). Historically, the "common" people have been industrial workers, farmers, tradespeople, and small business owners. The identity of the elite has varied but typically includes business executives, university faculty, those earning their income in the financial sector, such as large-scale investors, and many civil service government employees.

The second feature of populism, readily illustrated by Presidents Trump, Brazil's Bolsonaro, and Hungary's Orban, is the notion that ordinary people organize around charismatic leaders. These leaders emphasize their support for the "common people" by aligning with them against a common adversary—the elite. An overarching theme is the good, "common" people versus an evil elite that often includes government officials and bureaucrats. The leader also provides an alternative to professional politicians who have held their offices for decades. Some instances, such as the 2020 U.S. presidential election, include questioning and de-legitimizing political processes. A repeated theme espoused by these leaders is the disparagement of expertise. Instead, they emphasize "common sense" and provide simplistic solutions to complex problems

One mechanism to increase group cohesiveness is to have an outgroup that is the focus of collective scorn. For example, during the early years of the U.S. AIDS epidemic, the fact that those who contracted the disease were homosexual was a factor that brought the religious right, who viewed homosexuality as a sin, into politics during the Reagan era (Nelson, 1998). At the same time, members of the in-group must be continuously alert to the possibility of infiltration and manipulation by outgroups.

An outgroup seen as a common threat are the "elites"—particularly those with advanced education and specialized knowledge. The "common people" have intuitive common-sense knowledge lacking in the complex explanations provided by elites (Mansbridge & Macedo, 2019). The elite's corrupt morality is emphasized through anecdotes that inflame emotion. Students of populism have noted that communication colored by suspicion, resentment, and anger is more likely to become "viral" on social media platforms than less inflammatory content.

In several countries, the "dangerous others" of the pandemic were people of Asian background. In the early stages of the pandemic, an emphasized narrative was that the COVID-19 virus arrived in the United States from China (Boylan et al., 2021). The debate about whether the virus resulted from leakage from a laboratory, which was a possible form of bioterrorism, or a zoonotic virus that jumped from animals to people continues. However, China was characterized as "ground zero" of the pandemic. While emphasizing the role of the "Chinese virus" in creating the pandemic in the United States may have been perceived as justification for reducing the federal government's responsibility for handling the condition (Wright, 2021), other factors may have been at play.

Notably, blaming China for the COVID outbreak occurred in the context of China's increased prominence as a significant world power that could potentially overshadow the United States. In addition, in 2018, before the pandemic's onset, the Trump administration initiated a trade war with China. Members of the Trump administration suggested that Chinese imports might be a national security threat. As a result, the administration imposed tariffs and quotas on Chinese imports (Boylan et al., 2021). In addition, President Trump accused China of unfair trade practices and intellectual property theft during his re-election campaign. At one point, the Trump administration placed a 15% duty upon many Chinese imports. China responded with counter-tariffs ranging from 5% to 25% on U.S. imports into their country. Some have argued that from China's perspective, the United States was attempting to curb the country's efforts to become a significant global power. The "Chinese virus" could be a metaphor for the threat posed by China's economic and political growth.

As indicated above, a central theme of populist leaders is to have a clear adversarial relationship with an outgroup threatening the ordinary people's way of life. The trade war with China illustrates how having a scapegoat can redirect public anxiety and frustration about their economic well-being from one source to another. Indeed, as Western economies move away from manufacturing to information-based production, those without adequate training and background for the new economy are likely to express this fear and frustration by attacking a liberal, elite establishment and holding them accountable for their unfortunate situation.

Within the context of the COVID-19 pandemic, Lasco (2020) described essential elements of what he termed "medical populism," which, in many countries, led to preventable deaths. These characteristics and implications include: 1. Simplifying and downplaying the pandemic and denial of its seriousness; 2. The promise of uncomplicated, accessible, effective treatment; 3. Dramatization of the crisis and the government's responses to it with the populist government eschewing knowledge and recommendations of the scientific elite; 4. The battle between the ordinary people, led by the charismatic leader, versus the elites. There may be other denigrated "out-groups" such as immigrants; and 5. Invocation of knowledge claims and approved "experts" to support this stance (Lasco, 2020). However, this knowledge is often anecdotal, presented as common sense, and at odds with information and guidelines generated by the scientific elite.

The United States: COVID-19 and the 2020 Presidential Election

In the United States, COVID-19 emerged in the historical context of a presidential election. President Trump and his followers often portrayed the 2020 election as a crucial battle between the "real America" and the elites. The values of "real America" would be lost if President Trump and those elected officials who supported him did not prevail in the election. From previous Presidential elections, President Trump likely sensed that his re-election chances would be diminished if there was a COVID-19-induced economic downturn (Wright, 2021). (During Clinton's successful campaign to unseat President Bush, his advisors' mantra was "It's the economy, stupid.") Trump's initial stance was a denial of the seriousness and prevalence of COVID-19, stating that it was like a "case of the sniffles" that occurred primarily in healthy young people who would be minimally impacted. As cases and the death toll mounted, Trump's reasoning became cloudier. He attributed the increase in cases to the "great job" being done with testing. However, Trump also recognized that the more testing conducted, the more cases would be detected. Despite his praise, early testing in the United States was not well organized (Hedges & Lasco, 2021)—and featured a lack of collaboration between the Centers for Disease Control and the Food and Drug Administration (Wright, 2021). In response to criticism that the World Health Organization had issued a warning in late January of 2020 about the significance of COVID-19, Trump consigned WHO to the out-group of mistrusted elites and pulled U.S. funding for the organization (Gearan, 2020).

Trump's denial strategy was publicly displayed when he contracted COVID and required hospitalization. First, he deliberately took pictures while working in a Walter Reed Medical Center conference room. Then, famously, he and his intravenous line and pole rode around the Walter Reed area where many of his supporters gathered, putting Secret Service agents and hospital staff at risk (Gonsalves & Yamey, 2020).

As the need for medical supplies became more pressing, Trump invoked the in-group–outgroup dynamic by favoring states where the governors supported him politically. State executives who expressed appreciation publicly would be more likely to receive supplies. To shift responsibility for responding to the pandemic, Trump did not heed multiple legislators' advice to enact the Defense Production Act. This recommended action would temporarily convert industrial plants to produce COVID-related supplies. However, Trump indicated that securing supplies was the responsibility of individual states. Eventually, a type of federal-state hybrid emerged, with the Federal Emergency Management Agency (FEMA) coordinating the nationwide distribution of supplies to individual states. Several state officials and health care leaders reported that they had successfully contracted for a shipment of personal protective equipment, which FEMA commandeered. It became the federal government's role to determine which states were in greatest need, and there was evidence that these decisions were politicized. Mr. Trump's son-in-law, Jared Kushner, represented the President in this process (Wright, 2021). According to some accounts, Kushner was basically in charge of the effort to distribute COVID-related supplies to the states. He, however, emphasized a market-driven approach. In addition, there are suggestions that he also harbored considerable suspicion of the validity of the request for equipment—particularly from Democratic officials. For example, a county in New Jersey had ordered a large number of facemasks. It was soon learned that the federal government commandeered the shipment.

The governor of New York at the time, Andrew Cuomo, described how acquiring ventilators had become "like being on eBay with 50 other states." At one point, Cuomo believed he had secured a supply of ventilators, only to be later informed that California outbid him. In response to criticism by Governor Whitmer of Michigan and Governor Ensley of Washington, both Democrats, Trump publicly directed the head of his COVID-19 task force, Vice President Pence, to stop calling them. Trump stated, "I want them to be appreciative,… We have done a great job" (Mervosh & Rodgers, 2020). As noted above, testing became politicized. In one instance, a shipment of supplies was en route to a state with a Democratic governor and intentionally rerouted to a state with a Republican governor (Kanno-Youngs, & Nicas, 2020). The difficulty of coordinating a successful supply chain was repeatedly evident. In one instance, the governor of Rhode Island was promised that a truck full of personal protective equipment from the federal stockpile was on the way to her state. When the truck arrived at 9 PM, the governor learned it was empty (Wright, 2021).

Populism Internationally: The Philippines, Brazil, and Hungary

At the time of the pandemic, the leader of the Philippines, Rodrigo Duarte, considered a populist, had been implementing a harsh and punitive drug war that resulted in tens of thousands of deaths and drew criticism from the international community (Nadeau, 2020). Trump and President Duarte initially responded to the pandemic by minimizing its significance (Hedges & Lasco, 2021). Duarte then responded with displays of force and lockdowns that some critics saw as using the pandemic to continue human rights abuses and stifle dissent (Hapal, 2021). Issues with testing also emerged. Testing was restricted to particular groups who had possibly been exposed and considered "under investigation." However, when Duarte's political supporters received VIP testing, there was a powerful social backlash and public demands that testing be made more accessible. However, it rapidly became apparent that the government was not organized to conduct mass testing. In late May, Federal Phillipino officials argued that testing should be confined to those who needed it versus those who "just wanted it." However, local politicians, who were not supportive of the President in general, initiated local testing programs (Hedges & Lasco, 2021). Similar to the Trump administration, the Philippines' federal government, although initially not supportive of mass testing, attributed the rise in cases to greater testing capacity (Hedges & Lacso, 2021).

In Brazil, President Jair Bolsonaro also engaged in denial—stating at one point that COVID-19 was a hoax. Bolsonaro, like Trump, initially also blamed China for COVID-19. However, when a Chinese representative complained, recognizing that China was one of Brazil's major trading partners, Bolsonaro backed off the anti-China rhetoric. Instead, Bolsonaro targeted unnamed enemies, implying that the press was politicizing the virus and creating panic within the population. The Brazilian President made multiple public pronouncements about the economic threats of COVID-19 restrictions. Up for re-election in 2022, he repeatedly stated that unemployment and food shortages would be worse than the effects of the pandemic (Barberia & Gómez, 2020). Similar to the situation in the United States, by mid-March 2020, Bolsonaro was encouraging an end to social distancing measures and reopening businesses. However, his directives were, at times, opposed by regional government leaders. Bolsonaro's minimization of the pandemic's significance was conveyed to the public. For example, Bolsonaro did not maintain quarantine after contact with an infected citizen and readily hugged his supporters in public. Ricard and Medeiros (2020) suggest that Bolsonaro was partly motivated by his awareness that the economy would worsen during the pandemic with his COVID denial as part of a strategy to distance himself politically from this anticipated outcome.

Viktor Orban, Hungary's Prime Minister, since his second election in 2010, had been moving in a progressively autocratic direction. Orban used the surge in COVID-19 cases in Hungary to declare a "state of danger" (Adam, 2020), close down parliament, and further consolidate his power (Bufaachi, 2020). His initial response to COVID is best described as ambivalent. For example, he believed that schools should remain open and that classes should continue until the academic year's end. However, later the same day on which he outlined his belief that schools should remain open, Orban changed his position and closed the schools (Adam, 2020). Similar to President Trump, Orban described COVID-19 as similar to a mild case of the flu. However, at the same time, he enforced restrictive measures such as deporting 19 Iranian students for non-compliance with quarantine. The "state of danger" permitted Orban to have those arrested who were providing "misinformation" to the public." The authorities detained at least two opposition party members (Adam, 2020). Analyses of Orban's social media postings and other public statements about COVID-19 featured military and war-related references (Molnar et al., 2020). This terminology was helpful for several related reasons. It created a drama-laden crisis that the Hungarian President could use to support his consolidation of power. Additionally, it provided a rationale for the increased, visible public military presence that was reportedly working with the country's "strategic companies" (Molnar et al., 2020).

Populist Attacks on Science

Attacks on science have been a common theme of the populist repertoire. In the United States, attacks on scientists presenting data on climate change were ongoing well before the pandemic (Goldenberg, 2021; Krange et al., 2021). However, climate change denial appears part of a personal and political identity that shares features common to persons adopting COVID conspiracy theories. In several European countries, climate change denial is associated with nationalist, populist political attitudes (Krange et al., 2021). For example, surveys in Scandinavia report associations between climate change denial, anti-immigration views, and devaluing of diversity. The demographic most likely to hold these views are White conservative males (Krange et al., 2021).

In the early weeks of the COVID pandemic, Dr. Anthony Fauci, the Director of the U.S. National Institute of Allergy and Infectious Diseases (NIAID) and a medical advisor to multiple presidents, became a central figure in explaining COVID-19 to the public. Initially, most Americans found Fauci credible, and his direct approach and patience with those who were less informed were noteworthy. When President Trump began televised COVID briefings, Fauci was present and often contributed. However, over time, Fauci's diplomatic public criticism of the U.S. COVID testing program and his announcement that non-symptomatic persons could transmit the virus were not well received by the Trump administration. Furthermore, Fauci's strong public support for measures such as quarantine, stay-at-home orders, masks, and social distancing antagonized the Trump administration's efforts to return the United States to normal by mid-April (Dyer, 2020). In addition, given that it was an election year, some Trump supporters viewed Fauci as "working for" the Democratic opposition and attempting to prevent Trump from re-election (Wright, 2021). In the eyes of Trump and his supporters, Fauci became a member of the "elite"—touting science over "common sense." In multiple countries, "common sense" supported a "natural" approach to establishing immunity. This strategy would allow the virus to be transmitted so that many people would develop antibodies (Żuk & Żuk, 2020). The fact that this approach would likely result in many deaths was minimized.

Biocommunicability is a term used to describe how medical knowledge is structured and packaged to be presented to the general public and how people respond to this information (Hedges & Lasco, 2021). As Hedges and Lasco (2021) note, today, data can be packaged and circulated immediately. However, this same principle holds for misinformation or "alternative facts." For example, the governmental rejection of science was displayed at a public COVID briefing in which President Trump revealed he had been taking an unapproved COVID drug, hydroxychloroquine. Brazil's President Bolsonaro also became an advocate for hydroxychloroquine. The use of hydroxychloroquine to prevent COVID symptoms led to a memorable televised COVID briefing in which Trump advocated for the drug and revealed that he had been taking it and felt "pretty good." Fauci was asked whether hydroxychloroquine could be used for COVID-19 and responded negatively. Four days later, a man in Arizona died after eating a form of hydroxychloroquine used to treat fish tanks. Slightly more than a week after the news conference, the FDA approved the emergency use of hydroxychloroquine. Three months later, the drug was withdrawn. It was concluded that it was ineffective in treating COVID-19 and had many significant adverse effects, including liver injury and cardiac problems. When paired with azithromycin, it was found that people were twice as likely to experience cardiac arrest compared with those who took neither (Wright, 2021).

The Climate of Conspiracy

Conspiracy theories, as shared beliefs, can provide a community to those who are alienated and feel increasingly disenfranchised (Goldenberg, 2021). An "effective" conspiracy theory ties ambiguous information such as newsworthy events with a more pervasive causal explanation. This alignment provides an overarching reason for otherwise inexplicable events and fits neatly into the conspiracy theorists' worldview. The explanatory power of this storytelling can also entice new members to the group, ultimately getting them to subscribe to the worldview of that group.

Historically, conspiracies peak not only during times of uncertainty but also during periods of marked economic inequality. Moreover, Internet searches for conspiracy topics increase with unemployment rates (Imhoff, 2015). These findings are consistent with the suggestion that persons who feel politically powerless are more susceptible to conspiracy theorizing and are more likely to accept statements from sources that question the legitimacy of the political system.

Conspiracy theories associated with illness date back at least to the Middle Ages. For example, the conspiratorial anti-Semitic belief that Jewish people were poisoning wells and causing the pandemic was common during the Black Death (Byford, 2021). In addition, the acquired immune deficiency syndrome (AIDS) epidemic was associated with several conspiracies (Kalichman, 2009). For example, people believed that the human immunodeficiency virus was created through the polio vaccination program in Africa (Butler, 2000).

At the time of COVID-19's onset, there were several theories gaining prominence—"Pizzagate," the "Deep State," the role of Microsoft founder Bill Gates in generating questionable vaccines, the hidden agenda of 5G communication technology, "Mass Formation Psychosis," and the "Great Replacement." These will be briefly described below. (A note to the reader: If these conspiracy explanations seem to rest on very strained logic, it is only because their foundation is, at best, shaky.)

The Deep State, Bill Gates, and 5G

There are several versions of the "Deep State." One version features career bureaucrats running a parallel government to the officially elected office holders. Another account holds that a combination of officials embedded in government, such as those in civil service positions, have partnered with entrepreneurs to run a shadow government (Johnson, 2021). For example, the Central Intelligence Agency is a federal organization that may be working against elected officials. Conspiracy theories generally assert that there are no random events and that threats such as COVID-19 are part of a designed attack on the legitimately elected government by those secretly exerting control for their ends. Agencies such as the Central Intelligence Agency, which is already pledged to secrecy, are seen as having the ability to surreptitiously undermine legitimately elected authorities (Johnson, 2021).

The concept, however, of a shadow government is not new. President Eisenhower, in the early 1960s, referred to the military-industrial complex. Johnson (2021) suggested that supporters of both Presidents Bush and Obama claimed that an underlying deep state was impacting foreign policy and working against the President's goals in that area. For the deep state, a major goal is to maintain power and promote a particular value orientation. As a result, entrenched government bureaucracies often have a plan to stave off any significant change that would diminish the agency's authority. This objective drives many local, state, and federal bureaucracies; the primary goal is to protect their agencies, obtain adequate funding, and maintain the status quo.

Support for the view of a deep state during the Trump administration came from an anonymous editorial published in the New York Times ("I am part of the resistance inside the Trump administration") and described how Trump's directives were often ignored tacitly in the face of bureaucratic resistance (Wright, 2021). Politicians such as Trump impugned the reputation of government agencies by linking them to the deep state. For example, Trump referred to a deep state Justice Department and a deep state State Department. A poll conducted in 2018 concluded that nearly 70% of U.S. citizens surveyed thought the deep state was likely real (Rohde, 2020). While not explicitly linked by Trump to the deep state, the character attacks on Dr. Fauci reflected a similar theme. As a high-ranking member of the Federal bureaucracy, Fauci was accused of being part of a plan to assist the Democrats in the upcoming election by diminishing the President's perceived competence in managing the pandemic. Another strategy to reduce the power of the perceived deep state is to attack the credibility of government experts. Fauci's appearances in Congressional hearings were frequently an opportunity to attempt to discredit him by claiming that he was illegally removing citizens' First Amendment rights (Congressman Jim Jordan) or colluding with the Chinese government (Senator Rand Paul). By early April 2020, Fauci's name began appearing in social media posts associated with COVID misinformation. Fauci was accused of exaggerating the number of COVID deaths and having financial interests in developing a vaccine. In mid-April 2020, Trump retweeted a post encouraging Fauci's dismissal.

One version of the deep state is that financially successful executives secretly collaborate with "moles" within the government. For example, because of his wealth and links to technology, Bill Gates was frequently described as having a plan to spread the virus deliberately. In addition, Gates had predicted a pandemic, such as COVID-19, in a 2015 Ted Talk. A conspiracy theorist used this information to assert that Gates had foreknowledge of the pandemic. Additionally, the Gates Foundation has advocated for vaccines worldwide for some years. This history of supporting vaccinations was part of spreading misinformation by preparing the population for a "pseudo-vaccine" to be used for social control. An alternate version of this scenario has Gates partnering with Anthony Fauci to use the COVID-19 pandemic to seize power and make large profits (Friedman, 2021).

The communications technology, known as "5G," is the most recent form of a broadband cellular network. It was designed to improve cellular transmission speed and quality. In early 2019, a Russian government English-language channel featured a report that 5G was potentially lethal. A French website elaborated upon this further, suggesting an association between the coronavirus development in China and the installation of 5G towers in Wuhan—the site of the initial COVID reports. These false reports led to 5G communication towers being vandalized in multiple countries and violent acts directed at communications engineers (Jolley & Patterson, 2020). Analysis of conspiracy-oriented websites indicates that they describe electronic waves emanating from 5G towers that contribute to COVID-19 by weakening the immune system. A slight variation on this theory suggests that COVID-19 is non-existent, and the symptoms and deaths attributed to COVID result from 5G radiation (Pogorelov et al., 2020).

Pizzagate

Bleakley's (2021) description of how the Pizzagate conspiracy became increasingly mainstream demonstrates how far afield and sensationalistic the perspectives of Q-Anon and like-minded other groups have become. It also has been of interest to communication theorists studying how conspiracies become part of popular culture (Bleakley, 2021). The Pizzagate narrative suggests that Democratic party leaders, specifically Hillary Clinton and her campaign manager, John Podesta, were involved in engaging in ritual satanic abuse of children at a pizza parlor, Comet Ping Pong Pizza, in Washington, DC. Mr. Podesta's emails had been hacked, and conspiracy adherents reportedly detected coded messages about satanic child abuse in their content. In early December 2016, a 28-year-old man, Edgar Maddison Welch, arrived at the Comet Ping-Pong establishment on Sunday afternoon when it was very crowded. After pointing a gun at one of the employees, Welch allowed the employees and patrons to clear the restaurant. After the restaurant had been cleared, Welch fired his gun into the floor and surrendered. Welch indicated that he had armed himself with an assault rifle because he felt it would be necessary to rescue the children from the pizza parlor's network of tunnels hidden under the floor (Haag & Salam, 2017).

When Jeffrey Epstein, incarcerated for sexual activity with minors, committed suicide, conspiracy theorists linked Epstein's death to the Pizzagate story. Some saw Epstein's death as mysterious, providing conspiracy theorists with a foundation to search for those who might want Epstein dead. The link was that former President Bill Clinton was a friend of Epstein's and had traveled to Epstein's private island (Bleakley, 2021). Even today, some conspiracy theorists believe that Epstein was intentionally killed because of the information he allegedly had about the Clinton family (Bleakley, 2021). In late 2019, Trump retweeted stories posted by Q Anon describing Pizzagate. While Pizzagate is considered a founding narrative within Q-Anon, it has become well known to the general public (Bleakley, 2021).

A 2016 survey indicated that nearly half of the nation's Republicans believe John Podesta's leaked emails contain coded messages referring to "pedophilia, human trafficking, and satanic ritual abuse." Of note, 24% of Democrats said Pizzagate is "definitely" or "probably" true (Raymond, 2016).

One additional element contributing to the web of conspiracy theories is apophenia—the human propensity to search for causal connections when confronted with ambiguity (Frincu, 2021). Some adherents of conspiracy theories have suggested links between the ideas themselves. Gates and Jeffrey Epstein have been erroneously linked to the vaccine manufacturer Moderna. Another link comes from the site "Truth and Conspiracy," describing how a Gates employee was charged with possession of child pornography and implies that the employee was connected to "a larger pedophile ring." The site suggests that Epstein, who was arrested for having sex with minors, reportedly knew Gates and may have had a personal and business relationship (Truth & Conspiracy, 2022). This type of connection implies that Gates's outward presentation of wanting to prevent disease worldwide with vaccines may be a strategy to hide less desirable actions,

The Great Replacement

The Great Replacement Theory originated in Europe and centered on the view that immigrant populations are replacing native Europeans in many countries. Some leaders have suggested that because of the cultural background of many immigrants, they will never be successfully assimilated into Europe (Ekman, 2022). Replacement theory has a history of being associated with "Islamophobia." Other groups targeted are African immigrants. Adherents suggest an inevitable European "race war" will soon occur (Obaidi et al., 2021). A 2011 book, *Le Grand Replacement*, by the French author, Renaud Camus, is considered a central source of this belief. The Great Replacement has been adopted by neo-Nazis and by right-wing political groups in Germany (Obaidi et al., 2021). Hungarian President Orban and other populist leaders have invoked the idea and argued that liberal elites are orchestrating the replacement process (Ekman, 2022; Obaidi et al., 2021).

The replacement theory came to worldwide attention due to a mass shooting in a New Zealand mosque that killed 51 people (Bergmann, 2021). A 74-page document written by the shooter was titled "The Great Replacement," in which conspiracy theories involving white genocide were emphasized, including conflict between Christians and Jews. The New Zealand shooter alluded to a global war between the Muslim world and the West. He praised U.S. President Trump as a symbol of renewed white identity and common purpose.

Moreover, the shooter revealed that Anders Breivik sanctioned the attack before it occurred. Breivik, now going by the name Fjotolf Hansen, who killed 77 people in Norway in two mass shootings, has expressed similar replacement theory concepts. The New Zealand shooter, an Australian citizen, was reportedly influenced by societal factions associated with racism and anti-Muslim views.

Mass Formation Psychosis

According to Mass Formation Psychosis, COVID-19 is not an actual condition. Therefore, there is no need for protective measures such as vaccines or social distancing or facemasks to prevent COVID-19 transmission. One of the leading advocates of this conspiracy theory is Robert Malone, a physician. He claims to have invented mRNA vaccines (a claim that appears unsubstantiated (Lee, 2022)). Lee (2022) indicated that one of Malone's mass formation psychosis theory sources was the Belgian psychologist Mattias Desmet (2022). In Desmet's opinion, mass formation psychosis is essentially group hypnosis that robs people of their ethical self-awareness and critical thinking abilities (Desmet, 2022).

Desmet and Malone claim that before the onset of COVID-19, the Global North's population was susceptible to suggestions because of a lack of social bonds and a generalized sense of anomic anxiety (Gonzalez, 2022). This heightened non-specific psychological distress makes people more susceptible to suggestion as in hypnosis (Lee, 2022). According to Malone, any explanation that anchors the distress and gives it meaning will be readily accepted. This public vulnerability allows leaders to present false ideas that are readily accepted. In light of that vulnerability, the population is likely to accept a narrative of a pandemic, such as COVID-19, presented by a leader such as a president, prime minister, or health care expert. If described as the logical response, directives such as distancing, lockdowns, vaccinations, and wearing face masks will be unhesitatingly followed. Desmet (2022) argues that these processes occurred in Nazi Germany and Stalinist Russia, where they were quite effective in convincing citizens to accept blatant falsehoods. Malone has had his Twitter privileges suspended for spreading COVID-19 misinformation, including anti-vaccination messages (Lee, 2022).

Ethics and the Cognitive Terrain of Conspiracies

From an ethical perspective, conspiracy theories seem to be fueled by inequality. When principles of Justice as fairness (Rawls, 2001) are threatened, belief in the prevailing social order begins to disintegrate. As Giacomantonio et al. (2022) note, a visceral experience leading to the adoption of conspiracy theories is that outside forces have disrupted "… the natural order of things" (p. 1). The accompanying anxiety and vulnerability activate a drive to seek out others. Evolutionary ethical theory and its offshoots in interpersonal psychological theories (Bowen, 1978; Haidt, 2012) describe a connection between fear and vulnerability, driving a search for social connectedness. Cognitive evolutionary psychology holds that establishing patterns between random, ambiguous events reduces their threat valence. This coherence allows one to predict, which, in turn, increases a personal sense of control. Adopting a conspiracy theory, even though appearing to outsiders to make causal connections between unrelated events, "restores a clear-cut simplified reading of reality in which control and agency are reinstated" (Giacomantonio et al., 2022, p. 2). Haidt's (2012) moral foundations theory holds that instinctive evolutionary processes guide seemingly ethical altruistic behavior. Andrade (2020) has posited that our neurological system has evolved to include an alliance detection system. Some support for this ethological claim comes from studies of coalitions and tribal connections developed among chimpanzees (Andrade, 2020).

As described above, the ethical principle of Justice as fairness has been under siege from income inequality. Giacomantonio et al.'s (2022) survey in Italy found that the economy took precedence over health in adopting COVID-19 conspiracy theories. Attachment theory, also based on evolution, describes anger as "a secondary emotion" masking fear. Metzl's (2019) study of men fitting the "deaths of despair" demographic found this pattern during interviews. Descriptions of anxieties about "the usurpation of health and economic resources" (p. 149) prompted subsequent angry diatribes about the Affordable Care Act and Obama-driven socialism. Ironically, many of the men Metzl interviewed received medical care from the "despised"federal government through Veterans Administration facilities and Medicare.

The growing income disparity and rise in un- and under-employment for segments of the population before COVID-19 further threatened the long-sanding natural order linking a steady, unionized job with a lifetime of financial security (Case & Deaton, 2020). Moreover, the imposition of the pandemic increased the sense of unpredictability about the natural order going awry (Giacomantonio et al., 2022). From the perspective of justice, some ethicists suggest that income redistribution and a stronger social safety net, while not eliminating conspiracy thinking, might reduce the anger and anxiety driving this reasoning (Andrade, 2020).

Finally, other ethicists, arguing from evolutionary biology, have suggested that conspiracy theories may have some benefits. Some of these philosophers invoke evolutionary theory and assert that being vigiilan to threats has adaptive value. Others suggest that in a democratic society, this hypervigilance to potential threats prevents harmful conspiracies from being enacted and provides a check on powerful elites (Andrade, 2020). Additionally, some conspiracy theories have turned out to have some elements of truth, such as the unethical treatment of African-Americans in biomedical research. Andrade (2020) suggests that when targeted appropriately, the movement toward patient empowerment and reduced paternalism may reduce the influence of conspiracy theories. In particular, when patients have all relevant information and do not suspect that content is being withheld or deception is occurring, trust in medical and governmental authorities may be enhanced. Patients' sense of control is likely to be further enhanced when they are reminded that they are able to rescind previously given consent. While this collaborative approach to health care is unlikely to eliminate medical conspiracy theories, adopting patient-entered care could reduce the emotion intensifying these beliefs.

The Health Care System

The United States

In the United States, the only Western country without a universal health care plan, COVID-19 emerged after decades of controversy about health insurance coverage for its citizens. The United States has a "patchwork" system of health insurance coverage, including employer-based private plans, government-based plans such as Medicaid (based on income) and Medicare (available to all Americans over age 65). In addition, there are federal health care programs for specific populations, such as those provided by the Veterans Administration and the national Indian Health Service. However, health insurance was either unavailable or unaffordable for those under 65 and unemployed, self-employed working in small, business, or employed part-time. Those without insurance had few options for receiving care and often delayed seeking treatment until symptoms became life-threatening. At that point, treatment might often be sought in hospital emergency departments which, under the Federal Emergency Medical (Emergency Medical Treatment and Labor Act) Treatment and Labor Act, could not turn away patients in need (Searight, 2019). However, reimbursement of care for the uninsured was often not forthcoming or was inadequate. This pattern contributed to many hospitals, particularly those in low-income and rural communities, having to close their emergency departments and/or cease to provide potentially costly care such as obstetrics. For example, between 2003 and 2013, 10% of hospital obstetrical units closed in New Jersey. Even though African-American women are three times as likely to die during childbirth, these closures disproportionately affected African-American communities (McGregor et al., 2021) and rural areas—particularly those with lower-income populations (Turrini et al., 2021). At the same time, the percentage of the U.S. Gross Domestic Product (GDP) spent on health care has been the highest in the world and is currently at 19.7%—equating to health expenditures of $12,530 per person (Centers for Medicare and Medicaid Services, 2022).

After many legislative compromises, U.S. President Barak Obama achieved a greater level of health insurance coverage for Americans than his predecessors who attempted health care reform. The Patient Protection and Affordable Care Act in 2010 extended health insurance to many previously uninsured citizens. However, because of the specific policies used to broaden health care coverage—increasing the income floor for Medicaid eligibility, offering tax credits for obtaining health insurance and establishing exchanges for purchasing health insurance,— a segment of the population remained unable to afford available health insurance. Additionally, the promise of favorable health insurance pricing did not materialize for several reasons. For example, private health insurers such as Aetna and Blue Cross Blue Shield left regions of the country that were not profitable. As a result, the competition in the health marketplace leading to reductions in insurance premiums did not occur. In 2015, approximately 8–9% of Americans did not have health insurance—a decline from nearly 16% in 2010, immediately before the ACA was implemented (Barnett & Vomovitsky, 2016).

Maintaining a payment system that involves private insurers led to disparities even among those with health insurance coverage. For example, Chou et al. (2021) found that those with insurance who switched to a lower cost, yet higher deductible health plan, were less likely to seek emergency room care for chest pain. Those with pre-existing cardiovascular problems and those from lower-income neighborhoods accounted for most of this reduction. Evidence suggests that these delays may lead to further cardiac hospitalizations and deaths. For example, lower-income patients are almost 30% more likely to be re-hospitalized for acute myocardial infarction 30 days after their initial hospitalization (Chou et al., 2021).

One of Trump's objectives before being elected president was to dismantle "Obama Care." Upon taking office, President Trump encouraged congressional passage of "Trump Care," officially known as the American Health Care Act. Trump, again, resurrected the historical criticism of any government-based health insurance, including Medicare, as a step toward socialism. An analysis by the Congressional Budget Office found that the Trump plan would have substantial cost savings but also result in a significant increase in the percentage of Americans without health insurance (Speed & Mannion, 2020). Although some elements of Obama's original Affordable Care Act were amended, such as the penalty for not having health insurance, most of its original features were preserved. Politically, reducing the number of those eligible under the ACA was likely to be unpopular. The "Trump Care" plan would, in essence, remove health insurance from many of those who had recently acquired it. Trump invoked the populist message that the ACA was associated with elites and not representing the general will of the American people. However, the Trump administration's failure to present a viable alternative while attempting to remove a recently established benefit was not, on the whole, successful.

Britain's National Health Service

While a government-based single-payer health insurance program has been suggested for the United States, Global North countries with universal coverage are not free of problems with health care access, quality, or health disparities. The status of Britain's National Health Service (NHS) has been a significant issue in parliamentary elections for the past three decades. The NHS, while equalizing access to health care regardless of income, has not been able to eliminate inequalities in health care quality (Klein, 1995). Established soon after World War II, the NHS is often presented as the foundation of British society. Because of cost and staffing issues, there have been repeated governmental discussions about the possible privatization of the NHS. Politicians have repeatedly found it necessary to remind citizens that the "NHS will be safe under my watch." During the past 30 years, government initiatives have been addressing these issues (Iliffe & Munro, 2000). For example, in 1991, the Thatcher government introduced provider economic incentives for patients to reach specific health targets. In 1998, the government established a new agency, the National Institute for Clinical Excellence (NICE), to guide Britain's health care professionals on evidence-based care. NICE has also developed guidelines around the cost-effectiveness of medical interventions (Rawlins, 2013). For example, during the COVID-19 epidemic in the United Kingdom, NICE published rationing guidelines for intensive care unit treatment (Wilkinson, 2021).

Capacity has been a long-standing NHS issue and was highlighted during the COVID-19 pandemic. Historically, ICU beds, physicians, and nursing staffing have often fallen well below the levels of other European Union countries. For example, in 2015, the United Kingdom had fewer doctors than many European countries of similar population size (Willan et al., 2020). While the total number of doctors and nurses has increased in the last decade, the increase in clinical activity has outstripped this personnel gain. In absolute terms, the numbers of physicians and nurses have increased in the past 5 years. However, the staffing growth has not kept pace with inpatient admissions or outpatient appointments. Nursing vacancies were almost 44,000 in England in the first quarter of 2019 (Willan et al., 2020). Recent Brexit guidelines present barriers to addressing this shortage through recruiting medical staff from other E.U. countries (Darlingwater, 2019).

Racism as a Public Health Issue

Overview of Medical Racism

In 2020, 20 U.S. cities declared racism to be a public health crisis (Krieger, 2020). While explored in greater depth in later chapters, African-Americans sustaining physical and psychological harm inflicted by the U.S. health care system has a long history. However, that history is not temporally distant. As recently as 2016, false beliefs about African-American patients were documented in a study of predominantly White U.S. medical students and residents. Up to half of these future and post-graduate physicians endorsed the prejudicial and outdated view that African-Americans had greater pain tolerance because of thicker skin (Hoffman et al., 2016). This erroneous view is likely to be a factor leading to under-treatment of pain among African-Americans in the emergency room (Hoffman et al., 2016).

Currently, Black mothers are dying during childbirth at an increasing rate in the United States. It has been well established that Black mothers have the highest mortality rate of any U.S. racial and ethnic group. In recent years, while maternal mortality has declined worldwide, mortality rates among Black mothers have increased (Adebayo et al., 2022). Health care within the African-American population is tainted by a history of distrust of the White medical establishment. Historically one of the most disturbing accounts of medical racism is the mid-1800s development of gynecological surgeries by the Southern physician, J. Marion Sims. Sims, believing that African-Americans did not feel pain, deliberately induced vaginal fistulas among women who were enslaved. Sims then repaired the fistulas without anesthesia (Owens, 2017; Searight & Johnson, 2022).

African-Americans are likely exposed to other pre-existing social determinants that elevate health risks. For example, food insecurity (Krieger, 2020) and the presence of food deserts in many low-income neighborhoods prevent minority residents from having healthy nutrition (Ghosh-Dastidar et al., 2014). In addition, health problems such as asthma are associated with exposure to environmental toxins. Environmental hazards such as incinerators or contaminated soil are more likely to be found in African-American neighborhoods—a phenomenon known as environmental racism (Njoku, 2021).

While much of the news coverage of essential workers during COVID-19 has focused on doctors and nurses, it is crucial to recognize that African-Americans are overrepresented in many service industries, health care workers, and the transportation sector—all areas considered essential (Krieger, 2020). Additionally, because of significant poverty, many members of the African-American community did not have a choice about working from home since it was not an option. To earn a living, they had to put themselves at risk (Sobo et al., 2020; McNicholas & Poydock, 2020).

According to Britain's National Health Service, the deaths from COVID-19 disproportionately affected racial and ethnic minority health care workers. This mortality also paralleled the death rates in general in the United Kingdom, which were higher among Blacks and Asians. For example, people in the United Kingdom from Bangladesh had twice the risk of death as Whites. Among those of Afro- Caribbean background, death rates were up to 30% higher than Whites in the United Kingdom (Sobo et al., 2020).

Compared with other countries, the United States has the highest incarceration rate—comprising 25% of incarcerated persons worldwide. In the United States, African-Americans are substantially over-represented among those incarcerated. In 2017, Blacks were six times as likely to be incarcerated as Whites (Wingfield, 2022). Penal institutions provide an environment conducive to spreading any contagious disease. Prisons have been sources of significant levels of hepatitis C and tuberculosis, and H1N1 influenza. The disproportionate impact of COVID-19 on African-Americans in the general population is also occurring in correctional facilities. Incarcerated African-Americans are 3.2 times more likely to acquire COVID-19 than White inmates (LeMasters et al., 2022).

Black Lives Matter

At the time of COVID-19's appearance in the United States, tensions between many African-American communities and law enforcement were high. Multiple deaths in recent years of African-Americans while being arrested and in police custody were publicized and received international attention (Oriola & Knight, 2020). On May 25, 2020, approximately 3 months into the pandemic, George Floyd's death, while being restrained by multiple Minneapolis police officers, triggered worldwide condemnation. Floyd's death prompted demonstrations on every continent of the world, except for Antarctica. Large-scale public protests were reported in at least 40 countries, including Britain, France, Australia, and Japan. Pope Francis publicly expressed "great concern" about the "disturbing social unrest in the United States" in response to the "tragic death of George Floyd," adding, "We cannot tolerate or turn a blind eye to racism and exclusion in any form and yet claim to defend the sacredness of every human life"(O'Connell, 2020).

The association between Blacks' overrepresentation among COVID-19 deaths (usually due to respiratory complications) and Mr. Floyd's statement, while restrained by the police, "I can't breathe," symbolized for many the view that Black lives are expendable (Apata, 2020). These incidents of death at the hands of law enforcement are part of a more pervasive picture of long-standing structural inequalities and racism (Bowleg et al., 2022).

Sociologists have reported multiple quantitative indices of Black over-representation as targets of police action. Numerous studies have shown that Black drivers are up to five times as likely to be represented in traffic stops and arrests for traffic-related issues. Black men face a 1/1000 chance of being killed by the police throughout their lifetime. The increased militarization of municipal police forces has led some to describe U.S. African-American neighborhoods as under occupation: "… Black, low-income communities, are often heavily over-policed and a large number of people are removed from these communities or under state control… leading to disruption in social and family networks" (LeMasters et al., 2022, p. e288). The Black Lives Matter movement, established in 2013, arose to address police acts of violence toward African-Americans and, more generally, highlight issues of discrimination and racism.

The issues leading to the establishment of Black Lives Matter have at least a 300-year history in the United States. The tension between the African-American community and predominantly White law enforcement dates back to the late 1600s, when laws were passed in the South that permitted any White individual to apprehend any persons who were enslaved. By the mid-1700s, many states had established patrols to prevent rebellion or insurrection among enslaved communities. However, one of their principal roles was to look for enslaved persons. These patrols typically had pre-Miranda rights latitude to stop, question, and punish alleged runaways (LeMasters et al., 2022).

Specific codes for African-Americans were enacted after the Civil War. Under these codes, primarily applied in southern states, African-Americans were required to provide documentation that they were employed. In addition, they could not work as farmers or servants without paying an annual fee. By the late 1800s, the passage of so-called "Jim Crow" legislation established racial segregation. Local law enforcement arrested African-Americans for even minor violations of segregation policies in public facilities.

During the Civil Rights era in the 1960s, the harshness with which police officers responded to African-American civil rights demonstrators led to greater support for civil rights laws. In the late 1960s, there were many race riots after the death of Martin Luther King. When a presidential commission investigated race riots, the

Kerner Commission, it was concluded that the police often actually caused these riots through acts of brutality. Even then, the Kerner Commission noted the African-American community's distrust of law enforcement (Gooden & Myers, 2018).

The War on Drugs during the Reagan administration and continued through the presidencies of Bush and Clinton led to much stricter drug laws and the development of a military orientation within police forces. This policy included no-knock warrants and raids on suspected drug houses. In addition, sentencing guidelines for drug laws favored the incarceration of African-Americans. There was a high disparity in sentence length between crack cocaine, commonly used among African-Americans, and powder cocaine, more widely used among White Americans (LeMasters et al., 2022).

When multiple officers beat Rodney King, video footage of the beatings was shown on television. After a trial, closely followed by the international community, the four officers who inflicted injuries upon King, including a broken leg and 11 broken bones in his skull, were acquitted. The reaction to the acquittal led to rioting for nearly a week. The National Guard and Marines were deployed with 50 deaths in related riots. In 2014, the police shooting of Michael Brown, who was unarmed and walking on the street with a friend, led to significant unrest in Ferguson, Missouri, which reappeared when it was determined that the officer involved was not going to be indicted.

Relevant to COVID-19, it appears that within the U.S. African-Amrican community, experiences and perceptions of the legal system are associated with broader attitudes toward other government institutions, including those providing health care (Willis et al., 2022). At least two studies have found an association between vaccine hesitancy among African-Americans and negative experiences with the police. This association was not found among White Americans. Willis and colleagues described these patterns as a form of "system avoidance." Rosenthal et al. (2021) explain that vaccine skepticism within the African-American community is not rooted in negative views of science or specific beliefs about vaccine contamination. Instead, many African-Americans' wariness of vaccines is based upon a much more pervasive distrust of government institutions, including law enforcement. This tie between vaccine attitudes and perceptions of law enforcement is not found in the general population (Rosenthal et al., 2021).

Conclusion

Once infected with COVID-19, a patient's illness course and prognosis will be influenced by pre-existing medical conditions such as type II diabetes, heart disease, risk behavior such as smoking, and overall health. Similarly, COVID-19‘s societal impact has been affected by many political, economic, and societal factors in existence before the pandemic‘s onset. Issues such as income inequality, political populism, distrust of governmental institutions, and health care financing have, in many cases, been developing over decades. These pre-existing social challenges strongly influenced health care for those with COVID-19, as well as adopting preventive measures, such as lockdowns, social distancing, and mask-wearing. The availability and uptake of the COVID vaccine were similarly impacted by long-standing issues of medical discrimination, distrust of authorities, and a rising international climate of political populism.

Romer and Jamieson (2020) report that early in the pandemic, the strength of COVID-related conspiracy beliefs was negatively associated with taking preventative measures, including vaccination. However, for some of the Global North's minorities and indigenous peoples, their history of exploitation by the medical establishment is genuine and not an expression of paranoid reasoning. In addition, younger adults with lower income and less education were more likely to hold conspiracy beliefs about the origins and seriousness of the pandemic promulgated by populist leaders (Romer & Jamieson, 2020). This populist movement, developing over the past 20–30 years, led to the election of political leaders who responded to the pandemic with denial, dismissal of science, and poorly organized national vaccination programs. The remaining chapters in this book, which examine different aspects of COVID's impact, also illustrate how the pandemic has spotlighted social problems that had been festering for many years.

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Chapter 3
COVID-19's Impact on the World's Population

Laura Dryjanska and Peter Battista

Introduction

This chapter discusses some of the indirect impacts of the COVID-19 pandemic in the global scenario. While it is impossible to have a comprehensive list of consequences of the pandemic worldwide, examples from different countries shed light on issues that are in some cases of broader relevance in other contexts. While a complete analysis of this effect on the populace of every country is beyond the scope of this chapter, studies conducted in several countries will be presented to give the reader a sense of the toll the pandemic has taken. These countries were selected based on available research at the time this chapter was written. Their inclusion is not a reflection of their perceived importance or status.

Beginning with mental health, the chapter moves into considering education, income, employment, productivity, quality of life, and government and political dynamics. These areas are also not an exhaustive list and certainly could be developed further. It is worth mentioning that while this chapter proposes a multidisciplinary approach, the authors identify as psychologists (a social psychologist and a clinical psychologist). Psychologists can address health inequities using a multilevel systemic approach proposed by Domínguez et al. (2020), taking action on individual, mutual, association, professional, policy, and public levels. Within healthcare, psychology can be seen as a hub science (Kazak, 2020) that partners with others to provide scientifically based information about human behavior and the biopsychosocial concomitants of COVID-19, treatments, and public health

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interventions, leading the way to health and recovery. The COVID-19 pandemic illness health disparities (Kaslow et al., 2020) affect exposure risk (e.g., crowding in home or work settings, inability to work at home, reliance on public transportation), illness susceptibility (e.g., overall health status, nutrition, stress levels, comorbid medical conditions, vaccination history), and healthcare access (e.g., health insurance status, accessibility of quality healthcare resources).

Mental Health

The full extent to which the COVID-19 pandemic has affected people's mental health will likely not be understood for many years. However, many studies conducted since the start of the pandemic have demonstrated that the pandemic has taken a significant toll. While there are some unique variations between countries and regions, depression, anxiety, and other mental health issues related to the pandemic have affected people throughout the world. Several mental health studies conducted in different countries during the pandemic are summarized here.

China and the Philippines

Much attention has been paid to China throughout the pandemic. In addition to being the origin of the SARS-CoV-2 virus, China's communist government implemented strict pandemic mitigation measures, known as Zero COVID, that could not be readily implemented in democratic countries (Duan et al., 2020). Several studies aimed at ascertaining the mental health impact of the pandemic on the people of China have been conducted. Wang et al. (2020a, b) conducted a longitudinal study that surveyed participants at the start of the pandemic and again 4 weeks later. The initial survey found 8.1% of participants were experiencing moderate-to-severe stress, 28.8% were experiencing anxiety, and 16.5% were experiencing depression. No significant change was found to occur over time. In addition, average scores of a PTSD measure were initially found to be significantly elevated. Although a significant reduction was observed 4 weeks later, the reduction was not clinically significant. A study by Xin et al. (2020) found significant, positive associations between mandatory quarantine and perceived discrimination, perceived high risk of infection, emotional distress, depression, and self-harm/suicidal ideation. The study also found a moderate, positive association between perceived discrimination and emotional distress. These findings suggest that quarantine comes at a high emotional cost.

Tee et al. (2021) conducted a study comparing the impact of the pandemic on the mental health of Chinese and Filipino participants and found that Filipino participants endorsed higher levels of depression, anxiety, and stress than Chinese participants. The authors posit that this may be due the Philippines being a lower-income country and the lack of confidence Filipinos have in their healthcare system.

The United States

Unlike China and many countries, the United States declared a national emergency, but left much of the decision making to individual states. California was the first state to impose a stay-at-home order, and several other states followed (JAMC, 2021). However, many states did not impose a stay-at-home order. The lack of federal oversight led to a patchwork of COVID mitigation measures that varied greatly from state to state. COVID soon began spreading rapidly throughout the country. On April 10, 2020, the United States became the global leader in COVID-related deaths (Bialek Ryan et al., 2020).

A study conducted by Killgore et al. (2021) early in the pandemic found a significantly higher prevalence of symptoms related to depression, anxiety disorders, and suicidal ideation (among other symptoms) compared to pre-pandemic estimates. Those who experienced pandemic-related job loss were far more likely to experience these symptoms. Another study by Zhou et al. (2020) found similar, though somewhat more modest, results. They also found that those experiencing significant rumination, perceived lack of social support, and perceived COVID-related risk reported worse mental health outcomes. Utilization of positive coping strategies and following COVID mitigation guidelines were found to be associated with more positive mental health.

Czeisler et al. (2020) conducted a survey study in June 2020 and found participants reported depressive symptoms that were nearly four times those reported in the second quarter of 2019. Participants also reported anxiety symptoms that were more than triple those reported in the second quarter of 2019. More than twice as many participants reported serious suicidal ideation in the past 30 days than was reported in 2018. Approximately 10% reported increased drug use or starting drug use due to the pandemic. The authors found several groups were disproportionately affected, including essential workers, young adults, people of Black and Hispanic background unpaid caregivers for adults, and those in treatment for a preexisting psychiatric diagnosis.

Italy

Italy was the first European country to enter a nationwide lockdown during the COVID-19 pandemic (Masiero et al., 2020). The lockdown lasted from March 9 to mid-May, depending on the region. It confined people to their homes and resulted in social isolation for many (Fiorenzato et al., 2021). Rossi et al. (2020) conducted an

Internet survey during this first lockdown to assess the impact the lockdown was having on Italians. The findings showed that 37% of respondents endorsed rates for significant post-traumatic stress symptoms, 17.3% for depression, 20.8% for anxiety, 7.3% for insomnia, 21.8% for high perceived stress, and 22.9% for adjustment disorder. Young women were found to be more likely to endorse a negative mental health outcome. A study by Fiorenzato et al. (2021) found similar negative mental health outcomes related to the lockdown. They also found subjective cognitive impairment related to routine tasks involving attention and other executive functions.

Findings from Boldrini et al. (2021) showed the lockdown was associated with a 41% reduction in psychiatric hospitalizations in Italian general hospital psychiatric wards compared to the two prior years. This reduction was particularly prominent in patients over the age of 65. A significant decrease in more prolonged admissions was also found. In the months following the lockdown (May–June 2020), there was a 35% increase in patients reporting suicidal ideation at admission compared to the prior 2 years. The reduced psychiatric hospitalizations during the early pandemic were found for other countries. This pattern is more likely to reflect concern about contracting COVID in health care settings as well as health care resources being directed to the infection.

Sweden

Sweden's response to the pandemic was unique compared with other European countries—it did not impose a nationwide lockdown in response to the pandemic (Swedish Institute, 2022), giving us a sense of how the pandemic may have affected those who were able to mostly continue with their lives as they had before the pandemic. A study McCracken et al. (2020) found significant depression, anxiety, and insomnia among Swedish participants. Rates were found to be especially high in those with self-reported poor health and a history of mental health problems. A concerningly high number of respondents (14.9%) reported recent suicidal ideation. For those who reported suicidal ideation, 28.6% reported no prior mental health issues.

Brazil

Like the United States, Brazil's government took a rather "hands off" approach to mitigating the pandemic (Médecins Sans Frontières International, 2021). It, too, went on to become an epicenter of the pandemic and leader in COVID-related deaths. A study conducted during the first wave of the pandemic by Vitorino et al. (2021) found participants endorsed a significantly high level of depressive (41.9%) and anxiety disorder (29.0%) symptoms. These rates far exceeded the rates known to exist before the pandemic.

Egypt

In a comparative study (Shuwiekh et al., 2020) of several Middle Eastern countries, Egypt was found to have fared the worst, with participants exhibiting the highest levels of COVID-19 traumatic stress, PTSD, anxiety, and depression. The authors posit that in most Arab countries, traumatic stress related to COVID-19 uniquely contributes to negative mental health outcomes beyond that of prior traumas. The authors also found higher levels of PTSD, depression, and anxiety among Christians in Egypt, but not Christians in other Muslim majority countries and suggest that the additional stress of being Christian in a majority Muslim country may be a contributing factor.

Iraq

A study of COVID-19 related anxiety by Karim et al. (2020) found nearly half of participants reported health-related anxiety related to stay-at-home orders and 70% reported fear related to becoming infected that was equal to or greater than fear related to war. The authors suggest that prior trauma related to oppression, war, and violence may have been contributing factors.

South Africa

A study conducted by De Man et al. (2021) found that nearly half the participants met the Generalized Anxiety Disorder 7's and Patient Health Questionnaire 9's thresholds for depression (47.2%) and anxiety (46%) disorders. These participants reported significant consequences to their daily lives, but less than 20% reported consulting with a mental health professional in the month before they completed the survey. Distress related to becoming infected and distress related to containment measures were both found to be associated with anxiety and depressive symptoms. Poorer mental health outcomes were found to be associated with being female, being younger, living in a non-rural area, and having a preexisting mental health condition.

Education and Educational Outcomes

One of the major impacts of the COVID-19 pandemic that has concerned lives of families across the globe is the dramatic changes that occurred in the operation of schools and education in general. The lives of students have been disrupted in different ways, depending on their family situation, access to the Internet and electronic devices, personality, level and course of study, and the point they have reached in their education. According to Daniel (2020), this is especially true of students coming to the end of one phase of their education and moving on to another, such as those transitioning from high school to tertiary education, or from tertiary education to employment, have been facing particular challenges.

Various studies have been conducted with children across the globe during the COVID-19 pandemic. In Italy, Pisano et al. (2020) found that one out of four children showed regressive symptoms, demanding physical proximity to parents during the night and over 50% showed increased agitation, intolerance of rules, and excessive demands. A study conducted with parents in Spain (Orgilés et al., 2020) reported that 86% of children have had some changes in their emotional state and behaviors during the quarantine; including difficulty concentrating (77%), boredom (52%), irritability (39%), loneliness (31%), and worries (30%). A large study with children and adolescents in China found depressive symptoms among 22% of participants. In India, Saurabh and Ranjan (2020) identified worry (69%), helplessness (66%), and fear (62%) among the most common feelings that quarantined children and adolescents have experienced during the quarantine. A slightly different approach was taken by Sharma et al. (2020) who concentrated on risk and protective factors for adolescent and emerging adult mental health in Nepal. Risk factors found by the researchers were lack of mental health services, social media use, lack of understanding of lockdown restrictions, and sudden work- and student-life changes. On the other hand, protective factors included cultural acceptance of facemasks, school space repurposing, and free counseling.

According to Song et al. (2020), quarantine of children and youth has also resulted in increased risk of abuse and violence rates. The pandemic has seemingly had the most impact in the environments where children and their families were already vulnerable to verbal and/or physical abuse, compounded by the parents' stress and anxiety (Humphreys et al., 2020).

Overall, the impact of the COVID-19 pandemic on the mental health of children, as well as their educational outcomes, has been severe, according to recent research. Some scientists have referred to the shift from in-person to online education as a natural experiment (Tomasik et al., 2021), finding that, for example, in Switzerland, primary school students learned more than twice as fast attending school in person compared to remote learning. A systematic review of the effects of the pandemic-related school closures on student achievement by Hammerstein et al. (2021) concluded that there is clear evidence for a negative effect, especially among younger children and children from families with a low SES. The educational achievements with remote learning were similar to those when no teaching took place at all during summer vacation.

Income and Income Support

Income inequality, as an ecological phenomenon, potentially affects people through a psychosocial pathway; it has been considered a “social stressor” that causes social anxiety and chronic stress and erodes social support and cohesion, which are essential health resources (Avacena et al., 2021). Relative income differences within societies or income inequalities are related to differences when it comes to health and quality of life. Unsurprisingly, during the COVID-19 pandemic, the conditions at work of essential workers, or those in healthcare settings, retail, public transportation, cleaning and maintenance services, etc., have resulted in more exposure to the virus, and higher hospitalization and mortality rates (Van Dorn et al., 2020). Unable to practice physical distancing or to work from home, those with lower income were typically also at more risk during the COVID-19 pandemic. Living conditions of families with lower income, such as more crowded spaces at homes, have also had a more negative impact in comparison with higher income households. In a study that compared data from 84 countries (Elgar et al., 2020), researchers found that income inequalities were related to the COVID-19 mortality rates. Another study that looked at COVID-19 and income inequality in OECD countries confirmed the strong association between income inequality and the number of COVID-19 deaths (Wildman, 2021). According to Wildman (2021), COVID-19 cases and deaths were higher in countries with high income inequality due to the fact that countries with high income inequality were at a later stage of the virus as compared to more equal countries. Wildman (2021) has also demonstrated that the association was not caused by time since lockdown, nor by the stringency of the lockdown. Similarly, Sepulveda and Brooker (2021) took into account 22 OECD countries when considering this association in the age-stratified analysis. They found that income inequality and COVID-19 mortality were significantly and positively associated for all age groups. Researchers (Sepulveda & Brooker, 2021) proposed a possible explanation because a larger proportion of the population in those countries is at higher risk due to higher poverty, higher exposure, more comorbidities, and/or poorer access to treatment.

The COVID-19 pandemic has caused a steep increase in working from home. Researchers who conducted a study on working from home and income inequality in Italy (Bonacini et al., 2021) concluded that working from home exacerbates pre-existing inequalities in the labor market, especially if adequate regulations were not put in place. They suggested implementing income support measures broad enough to cover most vulnerable employees to counteract the existing inequalities.

In fact, research in countries that did implement income support measures to reduce the inequalities during the COVID-19 pandemic period in France, Germany, Italy, and Spain (Clark et al., 2021) seems to indicate that government interventions aimed at relief for the lowest income families were quite effective. Furthermore, Ofori et al. (2022) note that social globalization (which comprises information, culture, and interpersonal relations) during the COVID-19 pandemic had induced income inequality in the Middle East and North Africa. These authors also foresee further increase in income inequality in the region following the pandemic, with the rising social tensions related to unemployment.

Impact on Employment

Clearly, there is a link between income inequality and employment, as noted above. A large portion of income inequality is due to unemployment, which has been one of the first effects of the COVID-19 pandemic and strict lockdown procedures implemented in many countries across the globe (Dang & Nguyen, 2020). Following the initial impact on employment, with the reopening of diverse businesses, a demand for workers increased, at least in more market-driven economies (Carli, 2020). One major trend in employment during the COVID-19 pandemic consisted of large numbers of employees converting to work from home, changing work-related procedures, and navigating family-work balance in their lives. Constructs such as workplace resilience and organizational agility have become widely used in research, especially in industrial-organizational psychology (Bonacini et al., 2021). This is due to the fact that many organizations were forced to restructure and repivot in order to survive and increase their effectiveness, while gaining a competitive advantage. Following the lockdown period, in several countries the need for workers started to increase, causing many individuals to change their jobs. On the other hand, older persons who could retire early, frequently chose to do so due to health reasons and the fear of exposure to the virus. Furthermore, as Jiskrova (2022) points out, the widespread uncertainty might have led workers to reassess their work and life priorities, considering alternatives they had not acknowledged prior to the COVID-19 pandemic, or to realize that their work conditions have been unacceptable. As a result, some job markets experienced mass resignations, leading Klotz (Stark, 2021) to introduce an intentional label of the Great Resignation, which he considers as representing the cumulative effects of the pandemic on workers and the different ways in which workers experienced the pandemic. According to Klotz, the term surfaced a conversation that workers wanted to have and that many companies were eager to hear.

Research on employee agility and resilience capacity in South Africa demonstrated that these features can and should be promoted by organizations (Leask & Ruggunan, 2021). Worldwide, increasing attention has been paid to the mental health of workers, which should be the priority of the employers. Also, studies in South Korea that took into account family-work balance during the COVID-19 pandemic have shown that family support can be a coping mechanism that mitigates emotional exhaustion and enhances job performance (Shin et al., 2021).

Considering employment, research has been conducted with diverse types of workers. Especially early on during the COVID-19 pandemic, studies focused on those employed in healthcare and emergency response. For example, a study with Italian healthcare professionals working in close contact with COVID-19 patients emphasized their vulnerability to adverse mental health consequences (Lasalvia et al., 2021). The authors recommended implementation of interventions for these professionals. Similarly, a study with nurses in Ethiopia (Mekonen et al., 2020) found that a majority suffered from anxiety, stress, and depression, and could benefit from psychological health interventions like psychological counseling and group meeting sessions. Some interventions, such as psychological counseling and self-relaxation apps available to nurses in China, have been effective in fomenting post-traumatic growth (Li et al., 2022).

Subsequently, researchers took into account other professions, such as teachers in Romania, considering their motivation in the light of burnout and technostress related to online education (Panisoara et al., 2020). Another interesting example of research on employment in a specific sector includes studies by Mack et al. (2021) with transportation workers. They noted that transportation workers in tourism-related sub-sectors (e.g., taxi, scenic, air) were more likely to suffer from unemployment during the COVID-19 pandemic, as well as those in public transit (e.g., bus) and cargo shipping related industries (e.g., water) who were affected by shutdowns of nearly all activity during lockdown.

Besides considering specific professions, researchers have also focused on the impact of the COVID-19 pandemic in relation to gender and race. In the United States, Kantamneni (2020) noted the disproportionate representation of employees of color and women being displaced from their jobs in sectors most affected by COVID-19, such as restaurants/bars, travel and transportation, entertainment, personal services, and certain types of retail and manufacturing. On the other hand, women working in all sectors have been traditionally held more responsible for childcare, family care, and domestic duties, which increased during the COVID-19 pandemic, thus affecting their employment status across the globe (Carli, 2020). Dang and Nguyen (2020) have demonstrated that across China, Italy, Japan, South Korea, the United Kingdom, and the United States women were significantly more likely to become unemployed as a result of the COVID-19 pandemic, and experienced a much more significant income reduction than men. Similar disparity has been noted in India, even subsequent to the lockdown, women's recovery into employment has been substantially lower compared to men (Abraham et al., 2022). In addition, a study in Colombia (Cuesta & Pico, 2020) pointed out intersectionality in terms of the COVID-19 pandemic impact on employment, noting that women were more exposed to gender-based violence and their already-disproportionate involvement in caregiving for the family members, as well as work in precarious jobs, and in sectors highly exposed to the virus. Data from Australia (Churchill, 2021) pointed out that women, and especially young women, were underutilized in employment and there was a particular need for engaging high-skilled and qualified women.

Impact on Productivity

The COVID-19 pandemic has had a profound impact on workers, workplaces, and organizations, including productivity. As millions of employees have suddenly found themselves forced to work from home, often without prior training nor proper home-office space and equipment, in many cases productivity has become much lower. According to de Vries et al. (2021), the GDP for the advanced economies fell by 4.7%, nearly 2% points more than the fall in the emerging markets, and GDP by per capita dropped by 5.2%. These authors attribute the larger decline in advanced economies to lockdowns and other government-mandated restrictions of mobility, which were not implemented as much in many lower-income economies.

With lower productivity, especially initially, the challenge is to move beyond idiosyncratic ideals with flexible work arrangements (Obenauer, 2021) and to implement the optimal solutions that include remote, hybrid, and traditional channels. Organizations should take into account workers' health and phenomena such as "Zoom fatigue." A survey conducted in October 2020 (when 71 percent of people who could perform their job from home were doing so all or most of the time) demonstrated that one-third of people who were using videoconferencing often were worn out (Parker et al., 2020). Zoom fatigue has been demonstrated to increase with frequency and duration of meetings. On the other hand, the essential workers or those who had to continue to work in person and interact with others, had to perform additional tasks related to ensuring face covering (for themselves and patients, clients, or customers), new cleaning standards and routines, rearranging space to ensure physical distancing, etc. Beyond the physical and cognitive load involved in tending to these additional responsibilities, essential workers also had to deal with the stress of being exposed to the virus in a way that posed more risk than the general population, both to themselves and their families.

In turn, beyond negatively impacting productivity, the pandemic has also had impact on the quality of life of workers in organizations, including those working remotely and in person.

Quality of Life

WHO (n.d.) defines quality of life (QoL) as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." QoL domains include physical health, psychological health, level of independence, social relationships, environment, spiritual/religious, and personal beliefs (WHO, 2012). Many of the QoL studies that were conducted during the pandemic were focused on Health-Related Quality of Life (HRQoL), defined by the Centers for Disease Control and Prevention (CDC, n.d.-a, -b) as "an individual's or a group's perceived physical and mental health over time." Several QoL studies conducted in different countries during the pandemic are summarized here.

China

Qi et al. (2020) conducted a study early in the pandemic that assessed the relationship between stress, HRQoL, and physical activity. The majority of participants reported experiencing moderate or high stress levels, reduced physical activity, and increased sedentariness (which is not surprising considering many people were required to stay at home during the lockdown). The results showed a negative association between perceived stress and HRQoL and a positive association between physical activity and HRQoL. Lower HRQoL was found among those who endorsed increased sedentariness.

A study by Wang et al. (2020a, b) also assessed the pandemic's impact on HRQoL during the first few months of China's pandemic lockdown. Similar to the findings of the Qi et al. (2020) study, the majority of participants reported significant reductions in physical activity and increased sedentariness. However, participants, particularly women, also reported being more aware of their diet and eating patterns and engaging in healthy eating habits (23% reported an improved diet, and 30% reported eating more fruits, vegetables, and milk products). Most participants reported no significant change in their sleep quality, and sleep quality was found to have an indirect positive impact on reported QoL. Sixty-five percent of participants reported satisfaction with their QoL, perhaps due to the increase in eating at home with family members that occurred during the lockdown and the positive relational experience that accompanied it. Both studies recommend engaging in regular physical activity during quarantines and lockdowns.

Brazil

The study conducted by Vitorino et al. (2021) discussed earlier in this chapter also assessed the pandemic's impact on QoL. In addition to finding high rates of depression and anxiety symptoms in participants, the study also found a diminished QoL. Negative spiritual/religious coping (e.g., feeling you are being punished or abandoned by God) was found to be positively correlated with reported symptoms of anxiety and depression. It was also found to be associated with worse physical and social QoL. Conversely, positive spiritual/religious coping (e.g., feeling loved and connected with God) was found to be positively associated with physical and social QoL. The authors suggest that these results may be due, in part, to the improved ability to cope in a general sense that tends to accompany spiritual/religious beliefs and practices. They also suggest that the sense of community and connection with God and others that tends to accompany religious and spiritual practices may contribute to positive social QoL.

Portugal

Ferriera et al. (2021) conducted a study in Portugal to assess the effects of pandemic-related quarantine on HRQoL. They found that participants undergoing quarantine reported higher anxiety and lower HRQoL compared to pre-pandemic levels. The authors suggest that the multiple roles homes took on during the pandemic (schools, offices, care facilities for sick family members, etc.) may have contributed to these findings. Women and older adults were found to experience the highest levels of anxiety and the poorest HRQoL. This may be due to the many roles women took on during the pandemic, such as homeschooling children and caring for family members while working from home, and the increased risk of serious COVID-19 illness experienced by older family members.

Saudi Arabia

Islam and Alharthi (2022) conducted a study to ascertain how the pandemic affected the QoL of households in Saudi Arabia. They found a significant reduction in QoL since the start of the pandemic. A more significant reduction was found in households headed by an elderly person, male, or a person who was unemployed or attained a lower level of education. This reduction was also found in lower-income households, households in western and central regions of the country, large households, and urban households. The authors suggest several reasons for these findings, a few of which are summarized here. The finding that female-headed households were less affected by the pandemic was unusual as many studies have found women were more negatively affected by the pandemic than men. The authors suggest this may be due to Saudi Arabia's efforts to empower women by providing them with more jobs, many of which are in the private sector (which was less affected by the pandemic than the public sector). Also, most recipients of Saudi Arabia's unemployment program are women. These financial resources have increased women's financial status in the country, while men have experienced increased job loss. The authors also posit that one potential reason for the reduction in QoL seen in urban households may be the higher number of people living in cities under poor living conditions and with limited sanitation.

Germany

A study conducted in Germany (Ravens-Sieberer et al., 2021) found the pandemic has had a significant effect on the mental health and HRQoL of German children and adolescents compared to pre-pandemic levels. Specifically, participants reported experiencing more mental health issues, higher anxiety, and lower HRQoL. Those of lower socioeconomic status, immigrants, and those residing in smaller dwellings were found to be the most affected. Girls who participated in the study reported lower HRQoL than boys. While this discrepancy existed before the pandemic, the pandemic appears to have exacerbated it. Participants between 11 and 17 years of age reported significant psychosomatic issues, as well as irritability, problems with sleep, and headaches.

Quality of Life in Cities

A review of the literature conducted by Mouratidis (2021) found several elements related to cities and urban planning that may have helped to mitigate the effect of the pandemic on QoL (including social relationships, work, residential well-being, leisure, travel, emotional responses, and health domains). A few examples include space conducive to walking, running, and biking; access to outdoor spaces (private and shared); a sufficient information and communication technology infrastructure; access to healthcare facilities; access to public transportation (with COVID mitigation measures in place); and access to blue and green spaces. While the presence of these elements in cities can mitigate the effects of a pandemic, thereby improving QoL, they can also positively impact QoL when a pandemic is not occurring. The author recommends that cities consider these findings when engaging in urban planning, with particular attention paid to addressing inequities and supporting vulnerable groups so all can benefit.

Government and Political Dynamics

In many countries, the COVID-19 pandemic has been known for causing more polarization among voters. Dionne and Turkmen (2020) noted that the primary sociopolitical consequence of the COVID-19 pandemic was the exacerbation of existing tensions and inequalities between and within groups. This has been used by politicians to win votes by openly encouraging a racist and xenophobic agenda, usually targeted at migrant workers and refugees, but also other minorities. In the climate of scarcity of resources and extensive demand on healthcare infrastructure, especially countries with universal healthcare would stress the "threat" of accepting migrants and refugees. As Kenwick and Simmons (2020) stated, COVID-19 pandemic responses are imbued with border politics.

Furthermore, the pandemic has also had an impact on leaders and their communication choices. After analyzing 1201 speeches of political leaders from 26 countries, Montiel et al. (2021) concluded that their rhetoric could be classified under two main typologies of populism or cosmopolitanism. On the one hand, populist leaders gained popularity based on spreading fear, anti-migrant sentiments (especially targeting Asians as responsible for spreading the virus), and emphasizing the scarcity of resources and fragility of the healthcare system. On the other hand, cosmopolitan leaders chose to concentrate on emphasizing solidarity and interdependence in societies. Virtually all countries at some point implemented some measures related to lockdown, mask mandates, and physical distancing requirements, as well as quarantine for infected individuals and those who have had contact with them. However, political and government dynamics dictated how to enforce such measures, ranging from a simple recommendation to military actions and monetary fines.

Conclusions

This chapter has considered some of the ways in which the COVID-19 pandemic has indirectly impacted various countries. Selected examples from specific countries have been presented to accompany some more general considerations. The pandemic has affected nearly all facets of life. Its impact on mental health has been significant. Many studies have found significant increases in depressive and anxiety symptoms related to lockdowns, quarantining, mitigation measures, and the pandemic in general. Not surprisingly, QoL has also suffered. This has been found to be especially true for HRQoL. While the full extent to which the pandemic has taken a toll on our physical and mental health is still being determined, it has clearly been profound.

Education and work have been significantly affected. Children's education has been severely impacted, resulting in significant disruptions to their learning and mental health. Unemployment increased because of lockdowns. Some people transitioned to working remotely, which was often stressful, while others experienced the stress of continuing to work in person. Low-income wage earners were disproportionality affected by the pandemic. Many continued to work in person, increasing the likelihood of exposure to those infected with COVID-19. They also tend to live in more crowded living conditions and are less likely to be able to afford healthcare. Burnout became common as the pandemic carried on and many resigned from their jobs and chose new career paths. Overall, productivity decreased, and the GDP of many nations fell.

Governments responded to the pandemic in a variety of ways. While some enacted strict measures, others took a more lax approach. Some politicians used the pandemic as a means to garner favor from their base, which exacerbated the polarization that had already been growing in some countries.

Recommendations

Based on these findings, we provide the following recommendations. Governments should use what has been learned from this pandemic to better prepare for future pandemics. Pandemic mitigation measures should address people's physical and mental health. Exercise, diet, and mental health support should be incorporated into lockdown and quarantine measures. Special attention should be paid to those who have been disproportionally affected, such as women and those of low socioeconomic status. Governments should provide economic support, especially for those of low socioeconomic status. School systems should work with local and federal governments to ensure high-speed Internet access is available to all students and safeguard equitable remote learning opportunities for all students. Employers should consider the mental and physical health of their employees and offer support to mitigate the stress of in person and remote work. Lastly, politicians should engage in cosmopolitanism rather than populism to reduce polarization and increase the sense of social solidarity that is needed to manage a pandemic.

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Chapter 4
Health Care During COVID 19: Systems and New Developments

Falu Rami

Health Care Systems Around the World: An Overview of Their Structure, Operations, and Funding

The medical response to COVID-19 was strongly impacted by how health services are organized and funded. Most countries of the Global North, with the exception of the United States, have some form of universal health care coverage. In order to better understand a given country's health care system, it is often helpful to compare and contrast their structure, priorities, and funding. This chapter begins with a selective overview of health care organizations in several countries. With these comparisons as a foundation, examples of selected countries' responses to the pandemic are described.

The United States Versus Canada

According to a 2020 Health Care comparison report of countries conducted by the Organization for Economic Cooperation and Development (OECD), the United States spends the highest percentage of gross domestic product (GDP) on health care and has also been reported to have the least efficient health care system. In addition, when polling those who do not get recommended tests for their health, the United States has the greatest proportion of patients who do not get recommended tests because of cost. The United States has what has been termed a "patchwork" of health care coverage. Employer-sponsored coverage is commonly provided with

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some of the insurance premiums borne by the employee. Government-based health insurance includes Medicare for persons age 65 or older and Medicaid for families with incomes below a particular level. Through the Affordable Care Act ("Obama Care"), individuals can purchase private insurance through state-based "exchanges."

Canada has a single payer system that provides universal coverage. Health care has an emphasis on preventative and primary care. The cost is shared between provincial governments and the federal government. In 2018 over 64% of costs were covered by this universal coverage. Only 12% was covered by private insurance and 15% accounted for out-of-pocket costs. Some limitations to Canadian health insurance include access to services, elective surgeries, and specialty care which has long wait times when compared to similar services in the United States. Out-of-pocket expenses in Canada are for services such as vision and dental care.

Switzerland Versus Germany

Switzerland has a universal health care system and mandates all its citizens to have insurance (Carroll & Frakt, 2017). The plans that are offered are like those offered under the Affordable Care Act with private insurance companies. Approximately 30% of individuals in Switzerland can get subsidies to offset the cost of the insurance. Though these plans are for non-profit basis, insurers offer private for-profit insurance as well, which provides a greater selection of providers and hospitals. For these voluntary plans, they could also decline individuals that have chronic conditions. About 86% of Germans obtain their health insurance plan through the national public system with some choosing to get private insurance. Premiums for the public system are based on income and there is a shared cost by the employees and employers. Physicians work in a fee-for-service setting and there are limits to how much they can get paid. Both countries spend about 11% of their GDP on health care.

Switzerland has 60% higher copays and out-of-pocket costs in comparison to the United States although health outcomes are similar between both countries. Germany's health care system was established in the late 1890s and is based on the type of occupation; its structure was shaped by the trade guilds. Germany requires all employed citizens and their family members to have health care insurance. Germany has social insurance with payroll deductions covered by employers and employees. Insurance does have out-of-pocket expenses. General practitioners are reimbursed per capitation instead of a fee for service. Specialists have negotiated rates but can see people on a fee for services as well. Individuals can access specialty care directly and physicians do not have the role of referring to other specialty providers or services, as is common in many Health Maintenance Organizations (HMOs) in the United States. Germans access care twice as much compared to the United States. Vaccination rates are approximately 30–40% less in comparison to the United States and fees for medications are negotiated with the pharmacy.

Germany ranks 4th in terms of the highest gross domestic product (GDP) on health care (10.4%) with the United States spending the highest (18%).

Great Britain

Great Britain created the National Health Service (NHS) at the end of World War II in 1948 (OECD, 2020). The NHS is Britain's third largest employer. Health care is universal and free and paid for by taxes (Carroll & Frakt, 2017). Britain spends 9.8% of its GDP on health care. NHS was initially independent of the government, however as of the 1990s, the government has become more involved due to the rising medical costs. In Britain, 10% of patients have private insurance. Great Britain has a tremendous shortage of health care practitioners resulting in a trend for hiring immigrant health care practitioners. The health care system in Great Britain has longer wait times for services and specialty care due to a shortage of health care practitioners. Britain has a lower nurse and physician-to-patient ratio in comparison to other European countries.

Brazil

Brazil is a middle-income country and established its new constitution in 1988, which instituted universal health care coverage as a right that must be provided by the State (OECD, 2020; Oliveira et al., 2020). Health care is decentralized and monitored by municipalities. Funding is provided by federal, state, and municipal governments (OECD, 2020; Oliveira et al., 2020; Tikkanen et al., 2020). Brazil's health system is named Sistema Único de Saúde (SUS) and was created in the 1980s during the country's social movement for re-democratization and was officially established in 1988 with the new constitution. Three key principles of SUS are: (1) addressing the universal rights to comprehensive health care at all levels and complexity, which includes primary, secondary, and tertiary care; (2) decentralized care monitored by the three levels of government—federal, state, and municipal; and (3) active social participation in creating and monitoring health policies and implementing them through federal, state, and municipal health councils.

The government plays a key role in SUS and the Ministry of Health (MOH) is tasked with the role of coordinating SUS, developing policies, auditing the care and services, planning, financing the health care program, and maintaining control of it (Tikkanen et al., 2020). The state government's responsibilities involve: governing regionally, coordinating key programs such as monitoring medications that are expensive, as well as delivering specialized services that are not decentralized to municipalities. Finally there are 5570 municipalities in Brazil that locally manage the SUS. Some of their responsibilities include: coordinating health care programs, service delivery, and cofinancing SUS. In addition to the federal, state, and municipalities' participation, the SUS has active public participation and is guaranteed by Brazil's constitution. The community participation in the public health system is guaranteed by the constitution. Therefore, the various health councils and conferences have 50% of its members that are from the community, the other members include providers (25%) and health system management (25%). Individuals on the councils and conferences are key stakeholders that discuss health policies and monitor how they are implemented.

SUS has been incrementally expanded since 1990, which has increased access to health care and progressed in achieving this goal. About 70% of the population receives universal health care with 30% owning private insurance. All individuals in Brazil including visitors and those that are undocumented have access to free services that are comprehensive. These services include primary care, outpatient specialty care, mental health, hospital care, and prescription drugs (Tikkanen et al., 2020). However, there has been decreased federal funding for SUS in the past 30 years and increased spending by municipalities. In 2017, the federal government had accounted for approximately 43% of the cost of public expenditures, states accounted for 26%, and municipalities 31%—spending much more on average than they are required to do.

A family care program was established in 1996, which emphasized local primary care teams that consisted of physicians, nurses, health care assistants, and dentists. There are over 27,000 health care teams serving 5560 municipalities. In addition, if needed,there is also access to specialized services that could be provided by specialty staff (nutritionists, psychologists, social workers, psychiatrists, pharmacists, speech and hearing providers, gynecologists, pediatricians, geriatricians, and more). The primary care teams are responsible for providing care to an estimated 2000–4000 individuals and households in particular geographic regions (Tikkanen et al., 2020).

The federal government tied an incentive to this team model in order to increase its implementation by funding it by the number of people served. Municipalities would receive up to BRL 10,695 for each family health team that is delegated to organize and deliver primary care services in that area. The municipalities appeared to be in support of this model as depicted by 98% adopting this family health strategy model in 2019. Similarly, in this year, there were more than 43,000 health teams and 26,000 oral health teams that accounted for care for 64% of the population and more than 133 million people.

There are limitations in the Brazilian health care system. There is limited access to physicians in remote areas. Despite this shortage of physicians in Brazil, 8000 Cuban physicians were required to leave the country by the Bolsonaro administration. Additional barriers to access for services and resources include declining Federal support for the universal health care program. Finally, despite the benefits of SUS there is increased cost sharing and money spent out of pocket for health expenditures. Tikkanen et al. (2020) note that more than 27% of the total health care costs are paid out of pocket and create a substantial financial burden particularly for impoverished groups; 5.3% of surveyed households in 2014 reported that the high costs for health services lead them to stop paying for items that were not related to health. The high costs of pharmaceutical drugs was the main culprit for these financial constraints, in addition there were limited medications that were free of charge under the SUS plan. In addition, there have been increased copayments that private health care plans have charged in the past 10 years.

Brazil is also attempting to address the health care disparities, coverage, services, and physicians availability per region in various ways. Over the years, there has been an increase in private medical schools and as of 2017, only 35% of the 289 medical schools were public schools, whereas 65% were private medical universities (Tikkanen et al., 2020). These statistics increased to 80% private medical schools in 2019. These shifting demographics associated with the high cost of private medical schools may in part account for the increased distribution of doctors in wealthier regions. In 2018, there was only one physician for every 3000 individuals that lived in municipalities encompassing less than 5000 people. In contrast with municipalities composed of more than 500,000 individuals there was one physician for every 230 people. In part, these regional differences and disparities are accounted by the medical universities and their locations.

Brazil has attempted to address these shortages through implementation of key initiatives including: national policies for physician education which includes residencies with specialties, regulating where the medical schools are located, creating incentives and new rules to open medical schools in areas with substantial health care needs, and other plans (Tikkanen et al., 2020). The next section discusses the health care plan in India.

India

India's health care is decentralized and the official government position is that Indian citizens are eligible to receive free outpatient and inpatient care which the states are responsible for monitoring. However, due to inadequate access to services and resources most individuals pay out of pocket and access private providers (Tikkanen et al., 2020). The Indian government had recent initiatives to provide care for individuals from lower socioeconomic backgrounds such as the National Health Protection Scheme, which provides opportunities to receive secondary and tertiary care at private programs. In addition, this initiative allows special groups such as government employees and factory workers to receive these services.

Although the Indian Constitution requires the government to ensure health for all and advocates for universal health coverage from each state, there has been a substantial lack of funding for health care in India (Tikkanen et al., 2020). There have been disparate state responses to addressing the health care needs of marginalized and vulnerable populations in India. The National Health Insurance Program, which was initiated in 2008, is one important initiative to reduce the financial impact of health care and its associated risk factors for impoverished groups. This program was called Rashtriya Swasthya Bima Yojana (RSBY). Since its inception, 41 million families enrolled in this program. Unfortunately studies show that the program has not had significant impact on reducing out of pocket spending for individuals. It is now subsumed under another initiative known as PM_JAY.

Given the lack of robust insurance options and their effectiveness in providing adequate health care services, a mere 37% of the Indian population signed up for health care coverage in 2017–2018. In addition, there were multiple systemic barriers to access to care including: lengthy wait times when receiving services at the hospital, perception of poor public health services due to limited staff coverage and availability (Tikkanen et al., 2020). In a step to address these disparities, the Indian government approved implementing PM_JAY in March 2018. This initiative has been described as a major step toward gaining universal health coverage in India. The initiative provides coverage for hospital services, for 40% of the country's population that are poor or low-income. It also increases preventative and other health care services that fall under the purview of primary health facilities or health and wellness centers.

In India, the individual states are responsible for monitoring health care activities. As a result there are widespread variations in how health care services are delivered across India, as well as the amount of services and resources that are available and how they are allocated. In rural areas and the district/local level, Panchayati Raj institutions may be responsible for health care administration and governance. Compared to other countries, India only spends 3.9% of its Gross Domestic Product (GDP) on public and private health costs, in comparison to the global average of 9.9%. Of this amount, the public sector is responsible for about 25% of health costs. There are multiple public insurance options including RSBY that provides health coverage for a majority of health conditions for those that are impoverished. However, many services such as outpatient care, primary care, and tertiary care are excluded. Another program for low income individuals includes the National Health Protection Scheme, which provides up to 500,000 INR for each family per year. These monies are available for secondary and tertiary health services including: inpatient and care post hospitalization. This plan has been reported to provide coverage for 100 million impoverished and vulnerable families who have to meet criteria established by the Socio-Economic Caste Census. The majority of the public insurance programs have been funded by the central and state governments with 40% funded by the states and 60% by the central government (Tikkanen et al., 2020).

In addition to the public health insurance programs, a crucial program is one that is known as the Employees' State Insurance Scheme that is available for organizations that have more than ten employees. In the past, only factory employees were eligible for this plan; however, it has been expanded to include other industry sectors which include: hotels, restaurants, transportation organizations, media including newspapers and entertainment industries such as movie theaters. This insurance plan has employee and employer contributions. Employees contribute on average 0.75% of their income and employers contribute 3.25%. Employees do have to earn a minimum of INR 21,000 per month to be eligible for this program. Coverage and services for employees and family members include: maternity care and disability benefits. The Indian states cover approximately one-eighth of the medical costs with a maximum of INR 1500 per individual. An estimated 133 million individuals are beneficiaries of this health care plan. Approximately 36% of people in India have private insurance that covers hospitalizations.

Although in theory Indian citizens have access and are eligible for free health care in public facilities and do not have to pay deductibles, or co-payments, because there is limited funding for health care by the government, there are extreme health care access issues at the facilities. In addition, most of the outpatient and inpatient care is provided by private facilities that are expensive where fees are paid out of pocket. Out of pocket costs are the primary mechanisms for funding health care in India and contributed to 65% of the total health costs in 2015–2016 (Tikkanen et al., 2020).

Comparison of Different Health Care Plans

Carroll and Frakt (2017) provide an analysis by expert judges representing diverse interdisciplinary fields and expertise in health care. The judges compared eight different countries' health care systems. The health care systems include single payer systems, private insurance, universal health care, and social care. The following comparison of health care systems mainly consists of high-income countries from North American and European regions.

Both Canada and Great Britain have single payer systems, however the government's role and what is covered varies in each country (Carroll & Frakt, 2017). In Great Britain, the government pays for health care, and it is covered through the National Health Service. The system is financed through taxes and most services are free to its citizens. Ten percent of UK citizens buy private insurance though 80% of health care costs are covered by government spending. In Canada, the government finances health care although the actual operation occurs at the private sector and at the provincal level. Many Canadians supplement this with private insurance as well to pay for prescription drugs, dentists, and optometry. Some U.S. similarities to Canada and Britain's health care system include Medicare, which is similar to Canada's coverage for all citizens and The U.S. Veteran's Healthcare System that has similarities to Great Britain's NHS. Both countries (Great Britain and Canada) spend about 10% of their GDP with similar outcomes. Britain has better access to services and shorter wait times than Canada.

As noted earlier, the United States has a mix of insurance types consisting of a single payer, including Medicare for those that are 65 or older. U.S. also has Medicaid managed through the states for those with lower incomes. Private insurance is offered through market insurance exchanges through the Affordable Care Act and also by employers (Carroll & Frakt, 2017). In the United States, 28 million people are uninsured, and hospitals are private except for the Veteran's Administration.

Singapore

Singapore has a unique approach to health care that requires employees to contribute a significant amount of their pay into mandatory savings accounts that could be used to pay for health care, housing, insurance, education, or investment with employers contributing a portion of this (Carroll & Frakt, 2017). Basic care provided in government hospitals is inexpensive and at times is free. Individuals that prefer to have private rooms in hospitals could pay extra for these services and treatment. The Singapore government attempts to control costs by making decisions about new technologies that will be utilized in health care system, how many medical students and physicians to approve of in the country, and how much these providers will get paid. Singapore also decreases pharmacy costs by purchasing medications in bulk. Singapore spends 4.9% of GDP on health care versus the US which spends 18%. Singapore is thought to provide quality care despite the lower GDP spent on health care. Others allege there are wide disparities in treatment based on socioeconomic status.

Australia

Australia provides free inpatient care at public hospitals and a range of other medical services and prescriptions (Carroll & Frakt, 2017). Australia also has private health insurance that provides access to private hospitals and some services not covered by the public system. More than half of the hospitals in Australia are public. The government covers 85% costs of outpatient services and 75% of the fee schedule for those with private insurance who use public hospitals. Most doctors in Australia are self-employed or participants in groups and are paid fees for services.

France

In France, everyone is required to have health insurance covered by taxes and nonprofit funds (Carroll & Frakt, 2017). Public insurance covers 70–80% of costs and people are also able to buy private insurance. Up to 95% of individuals have this voluntary health coverage, which is covered through employers and other avenues. The Ministry of Health sets prices for procedures and drugs. They also regulate the number of hospital beds there are, how many medical students are trained, and the type of equipment that is purchased. France spends 11.8% of its GDP on insurance in comparison to Australia which spends 9%. Access and quality of care are similar in both countries.

Social Care Versus Health Care

In some countries, there is also a dialogue about social care versus health care which is prominent in Britain and France (Carroll & Frakt, 2017). Governments with single payer systems have well-developed services for social issues that impact health such as domestic violence, safe communities, and school lunches to name a few. Social care also addresses deeply embedded systemic and structural issues that impede health such as discrimination, income, access to high-quality childcare, access to safe and affordable housing, and quality food, and protects vulnerable groups such as those suffering from severe mental illness, and child abuse victims. The majority of OECD countries spend a significantly higher amount of money on this social care system in comparison to the United States, which spends comparatively limited funding for these services.

International Responses to the Virus: Case Examples

Globally, countries reacted to the COVID-19 pandemic with various responses, which reflected the resources in the area as well as cultural, regional, and religious diversity (Karamouzian & Madani, 2020). The following sections discuss COVID-19 responses in the Middle East and North Africa (MENA) regions, Peru, Brazil, India, and low- and middle-income countries (LMICs).

COVID-19 Response in the MENA

COVID-19 was not declared a pandemic in the region until March 11, 2020, though the first case was reported by Iran in the MENA region in late February (Karamouzian & Madani, 2020). As of May 6, 2020, COVID-19 spread through the 22 countries of the MENA region with over 224,000 cases and more than 8300 fatalities. However, these numbers are predicted to be far lower than the actual data due to limited access to testing and inadequate case reporting and tracking. Though various countries have challenges with COVID-19, there are significant barriers in the MENA region due to poverty and regional conflicts.

In addition to wealth disparities, there has been no uniformity in the ways different regions have managed COVID-19 as evidenced by the temporary lockdown in some regions, denial of the dangers of the pandemic in other regions, attempts to suppress news about COVID-19, and in other regions having lenient approaches toward its management (Karamouzian & Madani, 2020). COVID-19 responses are particularly limited in countries that have conflict and unrest and have resulted in the forced displacement of millions of people (Syria, Yemen, Iraq, Afghanistan, and Libya). Additional barriers to treatment and testing in these countries include limited funding for health care facilities, destruction of health care facilities and structures due to prolonged conflicts, and lack of sufficient health care staff. Though there has been some support provided to certain countries in MENA it has not been uniform. Support includes providing staff with training, testing kits, guidelines for hospital preparedness, and case management. Furthermore, there has been difficulty providing technical support to MENA due to logistical issues, curfews, and lockdowns. The next section describes the COVID-19 response in Peru.

COVID-19 Response in Peru

Alvarez-Risco et al. (2020) discuss Peru's approaches to squashing fake news about COVID-19 to mitigate the consequences by initiating prison sentences for those that distributed fake news. Peru ranks in the top 15 countries for COVID-19 cases and second to Brazil in Latin America. In addition to the surge of fake news via social media, there has been a rise in racism and discrimination against citizens of Asian background. Alvarez-Risco et al. (2020) also report multiple unproven religious and herbal remedies used to treat COVID-19. Multiple unproven prescription drugs have been touted to cure COVID-19 and a Peruvian magazine identified ivermectin on its front page as a potential cure for COVID-19. This prompted a strong counter-response from Peruvian physicians and scientists.

The Peruvian government also quickly squashed fake news through official social media at its disposal including fear generated by a news reporter that over 125,000 people would die from COVID-19 and presented factual figures that were much lower (3629) due to its implementation of strict social isolation measures (Alvarez-Risco et al., 2020). Other rumors were quickly ameliorated as well including both the minister of economy contracting COVID-19, as well as Peru's president due to his missed attendance at a daily press conference. The rumor also stated the president was very ill and was hospitalized. Peru, like other countries, also created a COVID-19 Peru website to combat fake news and information. This platform and other websites have addressed over 500 incidents of fake news. Peru is also the first country in Latin America to implement a prison sentence for those who disseminated fake news that results in creating panic in the public. Prison sentences range from 2 to 6 years. This information was also posted on the "anti fake news" website. These initiatives resulted in a dramatic decline in fake news about COVID-19 in Peru.

In addition, social media such as Twitter and technology companies have assisted in curbing the negative impact of fake news (Alvarez-Risco et al., 2020). Twitter has offered to delete accounts that have spread fake news; eBay and Amazon have deleted product offers and advertisements that claim they could curb COVID-19.

COVID-19 Response in Brazil

Oliveira et al. (2020) provide an overview and analysis of the action plan and strategies used by Brazil's Ministry of Health (MOH) to mitigate COVID-19's spread and devastation. Brazil's MOH took immediate action to diminish the impact of COVID-19 shortly after it was declared a public health emergency of global importance on January 30, 2020, by the World Health Organization (WHO) and a pandemic on March 11, 2020. Brazil immediately set up a Ministry's Emergency Operation Center on January 22, 2020. The Health Surveillance Secretariat coordinated the center, and it was used as a crucial venue to plan and organize activities with relevant stakeholders to examine the pandemic situation. In addition to the emergency operation center, Brazil mobilized a multitude of government sectors that developed plans of action. However, as international media reported, there was often conflict between health ministers and local health authorities and President Bolsonaro who fired several health ministry officials.

The MOH has taken proactive steps to inform the public through the dissemination of daily data on confirmed deaths and cases (Oliveira et al., 2020). The MOH has also had daily press conferences to be transparent in sharing communication and information with the public, and its planned actions to address COVID-19. In addition, epidemiological announcements have been published sharing with the public guidance and actions taken to monitor the COVID-19 situation. The MOH has also created other programs to reduce the spread of fake news such as creating a Coronavirus SUS application as well as a WhatsApp channel. Brazil's first confirmed case was on February 26, 2020, of an older man who had traveled abroad to Italy. Shortly after there were many more positive cases. Brazil's first death was on March 17, 2020, also of an older male. By March 20, 2020, the rapid spread of COVID-19 was acknowledged throughout the country.

Initially, the MOH attempted to curb the spread of COVID-19 through contact tracing and isolation as most of the cases were from those that had traveled abroad (Oliveira et al., 2020). However, it soon became necessary to employ other strategies to alleviate the spread of COVID-19 in the community. These new measures included hospitalization for those with severe symptoms of COVID-19 and isolation at home for those with milder symptoms and those that have encountered someone that tested positive. The MOH has also improved health care amid the pandemic through increasing National Health Service coverage, providing human resource training, and hiring more physicians. Through these actions, an additional 5811 job positions were created for physicians to work in that served 1864 municipalities and 19 indigenous health districts nationwide.

The MOH also increased capacity through its innovative action called "O Brasil conta comigo" where health care workers can be registered and trained to help combat COVID-19 (Olivira et al., 2020). Those that are eligible to register for this program include students from private and public universities in their final year that are studying medicine, nursing, physiotherapy, and pharmacology. The MOH has also taken action to produce, purchase, and provide personal protective equipment to health care workers to ensure their safety. The MOH has also spent a significant amount of money to scale up services and equipment to address more severe cases that require hospitalization by building units, renting beds in private or public sector hospitals, giving support to set up field hospitals, and other innovative actions. There has also been a heavy emphasis on producing and purchasing ventilators, which have been crucial in addressing the more severe cases that require hospitalization. The MOH has also tried to increase COVID-19 test capacity to identify those that may have contracted the disease.

The MOH also initiated a TeleSUS initiative that uses artificial intelligence to make phone calls to those suspected of having COVID-19 (Oliveira et al., 2020). This plan also guides those of COVID-19 signs and symptoms and ways to treat them at home without going to health care centers. Another measure that has been introduced includes the provision of telemedicine to address the impact on health centers not only by those that have tested positive but on others requiring medical care and to reduce traffic to those areas. The Federal Council of Medicine has provided regulations and guidelines for the provision of teleconsultation for services such as telesurgery, telediagnosis, and other forms of medical care. The MOH has also created another action plan to increase research, development, and innovation.

While not always supported by President Bolsonaro who was concerned about the pandemic's economic impact, Brazilian public health officials also recognized the need to adopt community measures to stall the acceleration of COVID-19 such as those recommended by WHO and adopted by other countries (Oliveira et al., 2020). These actions include limiting large gatherings, and community gatherings, reducing access to schools and universities, and limiting public transportation, to name a few. The authors note the need to balance restrictive measures with the economic and social impact and yet not wait too long to implement these measures given this would make it harder to contain COVID-19's impact. In addition, there are diverse populations and regions in Brazil, which must be considered versus implementing a uniform approach across all its states and municipalities. Brazil also has disparities in socioeconomic and living conditions that need to be considered when addressing the COVID-19 pandemic. Many live in impoverished conditions on the periphery of urban centers known as favelas with high population density.

COVID-19 Responses in Low- and Middle-Income Countries

There has been an overemphasis on COVID-19 responses and their sequelae in western countries (namely, North America, Europe, and Australia) to the detriment and lack of attention to ways that LMICs have addressed and created action plans and strategies to mitigate the impact of the pandemic (Kola et al., 2021).

COVID-19 was first identified in late 2019 and shortly afterward classified as a pandemic and continues to wreak multidimensional and devastating consequences to individuals, communities, and countries (Kola et al., 2021; Kola, 2020; Ornell et al., 2020). Variant strains of COVID-19 and its multiple phases over the past

2 years have resulted in psychological distress, financial and economic strain, loss of employment, physical health issues, overburdened health care structures and systems, and exhaustion among health care professionals. In addition, lockdown measures to mitigate the pandemic's spread have further conflated mental health issues and impacted access to care for all communities but have had a particularly detrimental impact on marginalized and vulnerable communities (Ammar et al., 2020; Di Carlo et al., 2021; Zhou et al., 2020).

Several studies have shown similar global mental health trends in multiple countries and continents, including Asia, Africa, Europe, North America, and other regions (Ammar et al., 2020). Online surveys conducted with Chinese and Italian participants reported that a significant amount of the population exhibited symptoms of depression, anxiety, and stress (Di Carlo et al., 2021). Amplifying effects of mental health symptoms include fear of infection, lockdown, social isolation measures, and lack of access to transportation or health care to diminish the impact of mental health symptoms (Di Carlo et al., 2021; Zhou et al., 2020). Furthermore, individuals diagnosed with mental disorders and who received psychiatric care were adversely impacted by a lack of access to and a reduction in psychiatric hospital admissions. The consequence of barriers to care for those with mental illness was documented in a study by Zhou et al. (2020). The authors reported that 18.1% of surveyed participants reduced their medication dosages, 17.2% stopped their medications due to their inability to get a refill of their psychotropic medications, and 25.2% of new patients with anxiety, insomnia, psychosis, or depression were not able to receive treatment (Zhou et al., 2020). Due to the adverse impact on individuals and their physical and mental health due to lockdown measures, acceleration of COVID-19 infections, and its impact on accessing care, it became apparent that innovative methods for providing care were essential. Some examples of providing innovative care included: telemedicine, telehealth, interdisciplinary team, and care provided in a primary care setting.

Telemedicine and Telehealth: Integrating into Primary Care

Because of social distancing policies, concerns about the spread of COVID-19 and lockdowns, telemedicine, which had been minimally used, became popular.

Ammar et al. (2020) studied the impact of home confinement and lockdown measures on participants' psychological distress. They analyzed 1047 responses that depicted the negative consequences of COVID-19 and home confinement on overall mental well-being and mood. There was an increase of 12.89% of individuals that experienced harm to their psychological well-being during home confinement compared to mental health trends prior to home confinement. Ammar et al. (2020) also conducted a mood and feelings questionnaire that depicted a 10% increase in depression during home confinement.

LMICs and countries that lack social safety nets for impoverished and vulnerable communities or lack economic resources for these groups display amplified psychological distress rates (Kola et al., 2021). These communities and contexts often had limited resources to access adequate health care pre-COVID-19 and are severely under-resourced during COVID. In addition, the lockdown and quarantine measures further limited access to health care resources and providers. In order to address complex emergencies, it is imperative to consider services such as telehealth and other applications such as the development and use of patient portals such as Mhealth. Multiple agencies, contexts, and countries support and have made recommendations for telehealth (Desborough et al., 2020; Di Carlo et al., 2021; Lin et al., 2020; Ornell et al., 2020; Smith et al., 2020; Vieta et al., 2020; Zhou et al., 2020). In addition, it is imperative to consider integrating mental health services into primary care, a practice that has widespread support in LMICs and High-Income Countries (Kanzler & Ogbeide, 2020; Kola 2020, Kola et al., 2021).

LMICs often integrate mental health into primary care practice due to the limited health infrastructures or health care professionals available to provide psychiatric services (Kola et al., 2021). Primary care is the first line of service in diverse cultural contexts and countries. Individuals that exhibit psychological distress seek services in primary care, particularly in LMICs, due to the general stigma associated with seeking mental health care. LMICs have also advocated for the inclusion of global mental health in universal health coverage and task shifting, the practice of training lay workers to provide nonspecialized health care services. LMICs have also promoted scaling up of digital technology to mitigate health risk factors associated with COVID-19 and increase access to services (Kola et al., 2021). Some examples of digital technology include mobile phones for health and mental health interventions. Large U.S. health care organizations (Kaiser Permanente, United Healthcare, the Veteran’s Administration) and nongovernmental organizations such as the World Health Organization (WHO) use digital technology and Mhealth applications. Other benefits of these technologies include increasing access and cost-effectiveness of resources (Kola et al., 2021).

Similarly, Di Carlo et al. (2021) analyze the rise of smartphone applications and programs that address mental health and psychiatric disorders, noting a development of 1435 mobile applications in 2019 that addressed multiple issues, including anxiety (449), depression (450), schizophrenia (282), self-harm (124), and substance use (14). As a result, consumers at lower risk may not require traditional therapy services or could augment psychiatric services through Mhealth applications and digital technology that would promote increasing self-help tools and coping. Furthermore, the global mental health applications market has been increasing at an annual rate of 38.3% and, by 2025, is predicted to be 111.1 billion US dollars.

Kanzler and Ogbeide (2020) have also advocated integrating mental health services into primary care. They note that primary care is the first access point for individuals with posttraumatic stress disorder symptoms and psychological distress. They document the rising trends of individuals displaying posttraumatic stress disorder due to COVID-19 and propose implementing behavioral health clinicians (BHCs) in an integrated primary care model. There are many benefits to incorporating BHCs into an integrated primary care clinic. Examples of benefits include assisting clients in mitigating the impacts of chronic diseases (e.g., diabetes), assisting in medication adherence, making lifestyle changes (e.g., quitting smoking, managing weight), and addressing various mental health issues, including substance use and addiction. In addition, changes to reimbursement and policies, most recently and as a response to addressing COVID-19 health and mental health impact, have resulted in increased coverage for services via telehealth and telemedicine.

Scaling up telehealth services and increasing use beyond this pandemic would be pertinent for future and ongoing health care. There is evidence that telehealth, other digital technologies, and Mhealth (portals) apps have been effective and increasingly used during the pandemic (Desborough et al., 2020; Lin et al., 2020). For example, a comprehensive and multi-pronged initiative implemented by the Australian government called the National COVID Primary Care Response (PCR) identified four main objectives (1) protect, (2) function, (3) support and provide treatment, and (4) build capacity (Desborough et al., 2020). Major components of the PCR included:

- Funding for the whole population model using telehealth to increase access to and provide medical care to all of Australia's populations.
- Development of call centers to triage people, educate, and refer them to appropriate health care services.
- Online care for workers.
- Protocols to protect vulnerable and remote Aboriginal and Torres Strait Islander communities by restricting access to them and assisting in preparing these communities.
- Efforts to have clear and consistent messaging to the primary care workforce.

The success of HealthDirect, the national call center, tallied 37,000 calls per week by community members and 370,000 individuals per day who utilized the downloadable symptom checker on their mobile phones since mid-March 2020. Efforts to provide consistent messaging to health care providers resulted in 50,000 views of online webinars and over 60,000 that accessed online newsletters since mid-March 2020. Additional efforts to support telehealth include funding through Australia's Medicare Benefits, ensuring all vulnerable groups have access to these services and creating incentives for health care professionals to use these services. Other studies have reported similar telehealth successes (Di Carlo et al., 2021; Lin et al., 2020).

In the pre-pandemic United States, only 28% of health care providers used telehealth services; however, during COVID-19 and sheltering restrictions to reduce infection, telehealth has been indispensable as a venue to increase access to services (Lin et al., 2020). Current trends in health care professionals' use of telehealth services suggest that it could become a common approach to delivering health care services. A study conducted by Stanford University presented data 2 weeks after the pandemic, which portrayed the jump in the rapid acceleration and use of telehealth and video visits by individuals starting at 400 a day and increasing to 3000 people a day. With respect to mental health, benefits of telepsychiatry include reducing the cost of treatment, increasing access to remote and rural areas, reducing wait times and costs associated with travel time, and reducing the stigma associated with accessing traditional psychotherapy sessions (Di Carlo et al., 2021). The authors note various randomized studies that show the equivalent effectiveness of telehealth and face-to-face sessions in impacting the reduction of symptoms. However, telehealth and telepsychiatry are contraindicated for some individuals. Patients that lack access to or familiarity with technology, individuals with a higher acuity of symptoms, or whose technology has poor audio or visual quality, or delays would be less likely to benefit from telehealth services.

There are manifold barriers to scaling up telehealth services and creating sustainability for its ongoing use as a modality of treatment (Di Carlo et al., 2021; Desborough et al., 2020). Many health care professionals still consider telehealth services inferior with reduced effectiveness compared to face-to-face services. Some factors that contribute to a bias against use of telehealth services include: lack of ongoing training and development for health care professionals in effectively using telehealth services, lack of consistent telehealth practices, lack of stable and consistent funding that reimburses for telehealth services, disjointed and complex organizational structure of health care systems, lack of telehealth training in educational curriculums, inequitable technological infrastructures for rural and remote regions and vulnerable and marginalized groups, and messaging to vulnerable and marginalized communities of the availability and access to telehealth services. Implementing consistent and practical strategies to address barriers to telehealth services would create a more substantial buy-in for all stakeholders and reduce costs and disparities in accessing services.

There has been overwhelming support for expanding and using telehealth from various organizations, contexts, agencies, and countries, which includes widespread support from LMICs to increase access to services, reduce cost, and mitigate the spread of infection through COVID-19 (Desborough et al., 2020; Di Carlo et al., 2021; Kanzler & Ogbeide, 2020; Kola et al., 2021; Lin et al., 2020; Ornell et al., 2020; Smith et al., 2020; Vieta et al., 2020; Zhou et al., 2020). Though telehealth is not a new concept and has been used in the past to deal with multiple international emergencies and disasters, there continues to be a scarcity of providers that are open to practicing it for multiple reasons. For example, the North Atlantic Treaty Alliance (NATO) created and used an early version of telehealth. NATO developed an innovative global telemedicine system in 2000 that deployed military forces used during crises. This telemedicine system created multiple solutions, such as portable telemedicine kits and satellite linkage. This solution allowed medical experts to provide health support to different countries (Smith et al., 2020). Telehealth was also successfully used to provide care for victims during Hurricanes Harvey and Irma. As a result, hurricane victims displaced from their homes were provided care. Other relevant examples include China's exploration of telehealth and the integration of electronic medical systems following the Severe Respiratory Syndrome (SARS) pandemic in 2003. Despite these benefits, telehealth has not been utilized effectively or sustainably to provide emergency services. Another example of the lack of telehealth use was the limited impact or use of these services by individuals impacted by the bushfire crisis, despite funding by the Australian government to support online mental health services.

Telehealth Approaches and Efficacy with Vulnerable Populations

The global lockdown procedures and mitigation efforts to curb the proliferation of COVID-19 infections worldwide adversely impacted refugees. The significant COVID-19 impact on refugee communities led to the development of alternative means of providing services to refugees and other vulnerable groups. Some examples of these alternate methods include providing teletherapy and assessment services, including video and telephone services to provide psychological assessments, support, therapy, and case management. Frequently these services require the use of interpreters. As a result, telehealth services to meet the acute demands of COVID-19 on refugee populations were used as an emergency measure.

Farokhi and colleagues discuss the experiences of telehealth in a survey of refugees that received oral health services. Farokhi et al. (2022) discuss the benefits and consequences of using telehealth approaches to providing care for refugee populations. Some limitations of using telehealth and technology with refugee populations included: limited access to laptops or access platforms (zoom, GoToMeeting, other platforms applications), lack of technological skills and resources to share vital information with health care providers, and other barriers, including transportation. In addition, Farokhi et al. (2022) found that an interdisciplinary approach to providing care and cross-disciplinary training was vital for providing quality care. Other barriers to care include culture, religion, linguistic barriers, and perception of health care services.

Refugees often had to be given multiple reminders and follow-up for appointments and care. In addition, the involvement of family members planned or unplanned, and the availability of in-person interpreters, impacted care during initial in-person triage visits and resulted in using interpretation lines (Farokhi et al., 2022).

Interpretation lines used with refugees had a multitude of problems. This writer's (FR) experience using interpretation lines with unaccompanied Central American refugees was dismal. Interpretation lines are not always adequately staffed. In addition, the use of telephone services to conduct psychological evaluations in public settings with limited avenues for confidentiality, lack of adequate resources such as a viable phone (versus a cell phone), and limited access to interpreters that speak various languages, including indigenous languages, is problematic. Finally, not all available in-person interpreters had adequate training to provide interpretation services. Many of the interpreters were volunteers from multiple agencies that spoke the language fluently and were there to aid. These situations resulted in guiding interpreters regarding their roles. Similarly, when working with Afghan interpreters that provided services for unaccompanied minors, it was often necessary to remind or provide prompts about the interpreted information.

Finally, using telehealth and video to provide services to refugees, including therapy and psychological evaluations, requires attention. The efficacy of telehealth services requires further research, particularly regarding its rapid implementation to provide services amid COVID-19 barriers to refugees. Although there are benefits to providing telehealth services to refugees for an array of services, there are also special considerations. This writer conducted asylum psychological evaluations with refugees as a mandate from Physicians for Human Rights. Psychological evaluations are lengthy and require the assessment of multiple factors, including history, body language, and tone of voice, to name a few. It is also essential to conduct evaluations in private settings due to the sensitive nature of the evaluation and questions. In addition, it is essential that when conducting these telehealth services, both interpreters, and refugee clients, are familiar with the technology. They must also have adequate technology and connectivity, a confidential space, an adequate crisis protocol, and secure HIPPA-compliant information (Farokhi et al., 2022).

O'Mara and colleagues (2021) provide an overview of the impact on refugee and migrant communities in Australia from COVID-19. They provide an analysis of the Australian government's attempts to mitigate the consequences of COVID-19 on refugee and migrant communities using telehealth. O'Mara et al. (2021) discuss the Australian government's attempts to mitigate the consequences of COVID-19 on access to health services by subsidizing Medicare (the universal health care) to use telehealth to provide services. Telehealth services supported by the Australian government's initiatives did not adequately address cultural and linguistic barriers and access to services and resources that these populations faced. Some of these barriers include providing guidance to these communities on confidentiality and privacy issues, eligibility, and access to Medicare, addressing fears of legal status including deportation, the stigma of accessing care, information about COVID-19 and accessing care, or having access to culturally competent professionals and guidance for accredited translators (O'Mara et al., 2021).

Conclusion

It is clear that the pandemic has been detrimental to individuals, families, communities, and countries including lack of access to care, overburdened health care systems, financial strain, psychological distress, and has exposed deep flaws in our health care structures and social systems. It has also resulted in substantial disparities and consequences to impoverished, vulnerable, and marginalized communities. Inequities between and within countries have been exposed along with a need to share resources, lessons learned, innovative ways to increase access to services, and reduce barriers. Though telehealth services and telemedicine have become a necessity in providing ongoing care, it is important to address potential future limitations to these services by ensuring there is ongoing funding by health care agencies such as Medicare. It is also imperative to develop plans to provide telehealth and telemedicine training and resources to individuals and communities that may lack access to technological services and platforms such as: indigenous peoples; the homeless, refugee, and immigrant communities; and those from lower socioeconomic groups. Providers also need to receive additional training in effective ways to provide telemedicine and telehealth services and be aware of special issues that may arise when working with groups from different cultures, socioeconomic backgrounds, and be aware of the ethical issues surrounding providing telehealth care.

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Chapter 5
Disparities, Discrimination, and Advocacy

Karen Brown and Laura Dryjanska

This chapter considers health disparities in light of the COVID-19 pandemic, concentrating on specific populations and advocacy initiatives. Health disparities have been a specific focus for the Centers for Disease Control for over 30 years. Dating back further, in 1915, the U.S. Public Health Service declared a National Negro Health Week and pushed for better access to healthcare and encouraged more Blacks to enter the healthcare field (National Archives, 2016). However, discrimination in health settings has recently begun to gain additional attention since the advent of COVID-19, where minority population groups were adversely affected in much higher numbers than non-minority groups (Kim et al., 2020). While physicians and researchers found that the high number of minority deaths during the pandemic was due to underlying medical issues, relatively few studies examined the health disparities that directly cause many of the underlying medical problems. The factors contributing to health disparities and the corresponding effects that these inequalities have had on cultural communities and entire population groups will be discussed below. Understanding these causal factors and manifested results will hopefully spur further advocacy efforts to work toward decreasing the health disparity gap while increasing support for underserved groups.

According to the Centers for Disease Control (CDC), health disparities are defined as "[the] preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations" (CDC, 2008). Population groups who are socially, racially, economically, or otherwise disadvantaged are the groups who face discrimination, marginalization, and oppression in many areas with physical and mental health being just two. Researchers have identified discrimination as the key factor in contributing to health disparities. Discrimination comes in many forms, however, the most easily recognized forms are racial, socioeconomic status (SES), and gender-based.

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Factors that Contribute to Health Disparities

Many factors contribute to health disparities, most of which can be found in discrimination of one form or another. Here we will briefly discuss the most salient forms of discrimination and how they relate to health disparities.

Colonization

To better understand the factors that have resulted in health disparities, one must gain a better understanding of the historic colonization policies that set things in motion. Colonization is the practice of dominant nations establishing settlements and instituting political, economic, and social control over subordinate populations. Such control often includes legal, cultural, and societal distinctions between settlers and the native population (O'Leary, 2007). There are many historical examples of colonization including European countries in Australia, India, Africa, Asia, and North America, the United States in Hawaii and Alaska, Japan in China, and China in Tibet. More recent examples include on-going colonization in the Caribbean from the United States in Puerto Rico, China in Africa, and Russia and former East-Bloc countries from the USSR. The sole goal of colonization was to subjugate and dispossess the native population of the culture and obtain resources for the benefit of the dominant nation (Bleich, 2005; Brown, 2017). Policies were written to advance the objectives of the dominant country and were utilized to justify all measures used to accomplish this goal. Native or indigenous population groups were abused, exploited, and enslaved to obtain resources and territory. Colonization policies served to dehumanize the oppressed population group by forbidding them to speak their language, destroying books and places of learning, desecrating religious icons and holy sites, denouncing their understanding of the world and the cosmos, and stripping their culture of meaning by dismantling the evidence of who they were, some of which will never be recovered (Brown, 2017; Hajioff & McKee, 2000; Murphy, 1997; Braveheart & DeBruyn, 2023). Modern-day racially discriminatory practices stem directly from these historic colonization policies that can be seen in institutionalized codes, protocols, and regulatory guidelines.

Race and Discrimination

Racial discrimination is defined as the unequal treatment of an individual or population group based solely on their race or ethnic origin. Further definitions include a power dynamic that allows unequal treatment and favors one race or ethnic group over another (Pager & Shepherd, n.d). Research into health disparities has shown that discriminatory practices can be inherent in institutional structures and policies even when they may not be present at the individual level (Ahmed et al., 2007). In describing the link between racism, discrimination, and adverse health outcomes, Ahmed et al. (2007) discuss the ideology that creates a hierarchal system of groups that ultimately lead to attitudes, beliefs, and differential treatment of those considered inferior. This ideology exists in individuals, which is then written into policies and systems that can impact educational, social, economic, and health systems long after the individual is no longer alive.

While the Implicit Associations Test (IAT) has generated significant controversy (Sukhera et al., 2019; Tinkler 2012), early research suggested that discriminatory attitudes may not always be acknowledged but do influence views of minorities. Bertrand and Mullainathan (2004) posit that implicit attitudes influence and impact explicit behaviors, sometimes in an unconscious manner. These unconscious mannerisms, or implicit biases, can often account for the disparities that continue to exist in physical and mental healthcare facilities. Utilizing IAT, researchers found that non-African-American individuals were more likely to associate negative connotations to African-American faces regardless of situational conditions or manner of dress and in opposition to explicitly expressed views (Bertrand and Mullainathan, 2004). Implicit biases, also known as unconscious or inherent biases, can have great influence on judgments through “processes of misattribution and disambiguation” (Spencer et al., 2016). Implicit bias has been considered to be a possible mechanism through which healthcare providers interact with patients based upon race. Research on the topic has yielded mixed results. A recent review found that in simulations, there was no consistent evidence of implicit bias (Maina et al., 2018). However, research based on actual patient encounters did suggest the presence of implicit bias leading to poorer provider-patient communication (Maina et al., 2018). At the neurophysiological level, research has shown that racial discrimination impacts the hypothalamic–pituitary–adrenal axis and may impair the functioning of the brain's prefrontal cortex. Additionally, neuroimaging studies demonstrate links between chronic social stress leading to persistently elevated cortisol levels which may, in turn, contribute to Type II Diabetes (Berger & Sarnyai, 2014). The Jackson Heart Study examined the association between hypertension, established as more common among African-Americans, and perceived discrimination. Following participants over an eight year period, it was concluded that racial discrimination significantly contributed to hypertension as well as other adverse health outcomes (Forde et al., 2020).

It has been well established that mental health symptoms increased during the pandemic in multiple countries. Research conducted in the United States during the first 3 months of the COVID-19 outbreak in the United States found an interaction between depression, racial/ethnic minority status, and mental health. Of note, Lee et al. (2002) found a dose–response relationship between perceived discrimination and depressive symptoms as well as suicidal ideation.

At the cultural and national levels, discriminatory ideology is still evident in the twenty-first century and around the world. Australian Aboriginals are currently experiencing the ramifications of historical and cultural discrimination that began in 1770. Colonization practices often called for maximum influence over colonized population groups, resulting in marginalization, repression, oppression, and the creation of long-standing discrimination policies (Bleich, 2005). Discriminatory ideologies and the resulting institutionalized policies that oppress minorities and those with lower socioeconomic status still operate in financial, educational, and healthcare institutions (Ahmed et al., 2007).

Institutional policies that directly contribute to racial discrimination include residential restrictions, limiting resources, and lack of ready access to medical care. In the United States, redlining, denying home loans, or steering minorities toward undesirable areas has long been a deliberate tactic to racially segregate cities and towns (Jan 2018; Mitchell & Franco, 2018). Discriminatory lending practices have been stricken from written policies; however, the practice of redlining continues to exist in many communities and contributes to both the limited availability of necessary resources and the ability to access medical care readily.

Religion and Discrimination

Similar to racial discrimination, researchers have found that religious discrimination directly impacts how individuals seek healthcare treatments and view providers (Padela et al., 2012; Thomas et al., 2014; Padela & Zaidi, 2018). According to the U.S. Equal Opportunity Commission (EEOC), religious discrimination is the unfavorable treatment of an individual or population group based on their religious beliefs or affiliations. This topic is essential to mention, as health inequities are often impacted by religious practices, traditions, and lack of cultural accommodations (Padela & Zaidi, 2018). Western-trained physicians often discount complementary and alternative medicine (CAM) in favor of traditional "science-based" Western interventions. Views of medicine and causes of illness determine health-seeking behaviors in communities that rely heavily on spiritual/religious practices (Lee et al., 2002). Faith-based organizations are reported to be instrumental in providing social services and promoting health initiatives in increasing numbers to decrease healthcare disparities (Asomugha et al., 2011).

In India, the Muslim community has been blamed for spreading COVID-19. Members of a Muslim missionary group were accused of bringing in people from foreign countries to deliberately spread COVID-19 (Sarkar, 2020). Subsequently, 300 members of the missionary group, known as the Tablighi Jamaat, were quarantined for 40 days by the authorities. With the false belief circulating about Muslims spreading the condition, there have been instances of discrimination and harassment. Sarkar (2020) describes how two Muslim men were made to kneel and apologize for spreading the virus.

Socioeconomic Status and Discrimination

Socioeconomic status discrimination is the unequal or unfair treatment of an individual or population based on the perception of their economic, educational, or social status (Adler & Stewart, 2010). Social determinants of health (SDH) are predictors of health outcomes and have been studied extensively by the World Health Organization (WHO) among others. Studies have shown that health outcomes can be predicted based upon working conditions, food insecurities, housing and basic amenities, discrimination and lack of social inclusion, education level, and access to affordable, readily available healthcare (WHO, 2022). Restricted access to any of these resources can be detrimental to health outcomes (Oates & Schechter, 2016). Research conducted by the Morehouse & Emory Team-up to Eliminate Cardiovascular Health Disparities (META-HEALTH) cohort studied cardiovascular health in African-Americans and Whites. Results found that African-Americans with a higher level of education suffered significantly more from poor sleep habits than African-Americans and Whites with the same or lower level of education (Van Dyke et al., 2016). The findings have been interpreted in the context of chronic stress based on a lack or perceived lack of economic, cultural, and/or social resources. Researchers believe that poor sleep habits in African-American males with a higher level of education may result from experienced discrimination at a higher level and in more varied settings than those who have less formal education. Additional research has suggested that the association between education and workplace discrimination may be related to African-American men being perceived as competitors by their White coworkers (Van Dyke et al., 2016; Mouzon et al., 2020). This study reinforced the concept previously described by Crenshaw (1991), which states that individuals who have intersecting identities that qualify them for discrimination experience oppression and marginalization that can impact their health over time (Jackson & Williams, 2006). This is a concept that can be easily recognized as racial and SES discrimination often work hand-in-hand.

The associations between race, SES, institutional [or structural] discrimination, and poor health outcomes, though complex, have been studied across the globe with similar findings. In the United States, neighborhoods created by redlining policies are predominantly populated by those who are economically, educationally, and/or socially disadvantaged. In the United States, the association between neighborhoods and health status has been well-established (Roberts, 1997). A recent study found that zip code accounted for 79% of the variance in COVID-19 prevalence (Munoz-Price et al., 2020). There are a number of interacting factors linking health status to place of residence. For example, it has been documented by researchers that many low-income and marginalized communities experience what is known as "food deserts" (Beaulac et al., 2009). Food deserts are defined as communities that either lack access to healthy food choices or are unable to afford healthy alternatives (Alexis, 2021; Moreland et al., 2002). These communities are inundated with fast-food restaurants, alcohol and tobacco outlets, and bars that entice and encourage unhealthy eating, drinking, and smoking habits contributing to chronic disease processes (Beaulac et al., 2009; Pereira et al., 2013; Zenk et al., 2005). Among persons with significant mental illness in an urban area, 50% resided in areas classified as "food deserts." These regions are also associated with elevated rates of obesity (Compton & Ku, 2022). Research has determined that lower SES status is directly associated with negative health outcomes and contributes significantly to health disparities both over time and across many different countries (Smith, 2003).

Additional Factors Contributing to Health Disparities

Other factors that contribute to health disparities include the disregard for any traditional or cultural knowledge and understanding that does not align with scientifically established medical practices (Balinski, 1998). Westernized medicine separates the concept of the physical body from the mind and treatment protocols are assigned accordingly. In contrast, indigenous and collectivist cultures throughout the world see life as a continuous circle with birth and death flowing seamlessly into and out of the larger universe. Indigenous communities often do not see mental health apart from physical health (Mobbs, 1991). Many non-Western cultures see behavior as being influenced by one's connection to the family, the local community, the land, and the cosmos at large (Mobbs, 1991). Western views of being in good health equate only in a small part to the indigenous concept of well-being. Well-being is the incorporation of the emotional, spiritual, social, and cultural aspects of one's interaction within the framework of community (Anderson, 1996; Mobbs, 1991). The Social Health Reference Group (2004) defined indigenous well-being as encompassing a broader concept that takes into account how critical it is for individuals to feel a connection to the land, the unique culture, their common spirituality, their family and ancestral history, and their community. All of these things work in tandem to develop well-being or good health. Disturbances in this holistic view of the life circle can result in behavioral patterns that Western psychologists may view and diagnose as mental illness (as cited in Zubrick et al., 2010).

Cultural Trauma and Health Disparities

Another factor that contributes to health disparities is the concept of cultural trauma. Cultural trauma is defined as a traumatic experience that has impacted an entire population group. It encompasses definite and distinctive traumas that are imprinted upon a group's collective consciousness. Community members will always remember the experience and that it has and will negatively and irrevocably impact and change their identity (Alexander et al., 2004). Cultural trauma binds members of a population group together in the experience even when members may be far removed from the original experience and is reflected in the perception of loss over time of one's cultural identity or meaning (Eyerman, 2002).

When discussing how cultural trauma relates to health disparities, one must have an understanding of how perceptions can impact behaviors and behaviors can translate into policies, guidelines, and regulations. The concept of cultural trauma was used to describe African-Americans and their experience with slavery in the United States, Native Americans and their experience with colonization, Holocaust survivors and their experiences in concentration camps, and most recently with the people of the United States and their experience with the terror attacks of September 11, 2001 (Alexander et al., 2004). Alexander et al. (2004) theorized that cultural trauma is an empirical, scientific concept that brings about a sense of social responsibility and political activism. This cultural trauma theory states that groups, societies, and even entire civilizations will cognitively identify the source, cause, and effect of cultural trauma and then take responsibility for assisting members of the targeted populace. Developing a sense of responsibility and identifying with the cause of trauma allows "outside" groups to share in the suffering of the traumatized group (Alexander et al., 2004). Alternately, some social groups reject a sense of responsibility and will not identify with the trauma's cause, thereby diffusing the trauma's reality and subsequent suffering (Alexander et al., 2004). Rejection of the reality of the trauma and its adverse effects on culture can lead to "outsiders" projecting responsibility for the originating trauma back at the targeted culture. This denial will cause the traumatized culture to suffer in isolation and lead to other experiences of discrimination (Alexander et al., 2004). Wilk et al. (2017) reviewed 61 articles on the negative impact of Canada's residential schools program and found that the physical and mental health of the First Nations people were long-lasting and intergenerational. These effects included decreased general physical health, increased chronic and infectious disease processes, low self-esteem, increased depression and anxieties, increased substance use and abuse, higher incidents of domestic violence, and increased suicidal thoughts, attempts, and completions. This pattern of characteristic behaviors has been seen around the world in other population groups who suffered through brutal colonization practices. These population groups include the Aboriginals of Australia and the Native American population in North America (Atkinson, 2008).

Unlike previous discussions of trauma, cultural trauma works for and against both the oppressor and the oppressed. Arthur Neal (1998) discussed the concept of national trauma, characterized by its enduring nature and effects related to experiences and events that cannot be dismissed from the social consciousness and ingrained memory of a group or culture (as cited in Eyerman, 2002). While the oppressing population group experiences the outcomes of cultural trauma, which may threaten their cultural/societal privilege, the oppressed population also experiences the outcomes of cultural trauma. Cultural trauma typically includes (an) originating event(s) that cannot be erased. For example, the collective memory of Canada's residential schools continues to negatively impact the next generation of First Nations children who did not attend these schools. There was a dose-response relationship between family members' (parents and grandparents) residential school experience and the likelihood that children and/or grandchildren were involved in the child welfare system (Barker et al., 2019). Canada's Truth and Reconciliation hearings made it clear that while painful, the residential schools were an undeniable aspect of Canadian history (Nagy, 2020). Cultural trauma often includes challenging the denial that acts of oppression did not occur (Eyerman, 2002). While the oppressed population group is continuously relegated to a place of systemic oppression, the dominant population group feels justified in feeling threatened by the oppressed culture, denying historical facts and events and believing they are the maligned population group. This pattern is currently seen in topics such as controversy regarding Affirmative Action policies, Diversity and Inclusion training, and most recently the Critical Race Theory debate. In discussing the feeling of being marginalized as a woman by male counterparts, McIntosh (1989) acknowledged that men were unwilling to commit to a sense of overprivilege but were willing to admit that women were disadvantaged. Similarly, she acknowledged that the concept of privilege was real and called it an “invisible weightless knapsack of special provisions, maps, passports, codebooks, visas, clothes, tools and blank checks.” Research has shown that dominant majority population groups may often be unaware of their privileges and advantages or of how their attitudes impact and discriminate against the minority population group (Advisory Board to the President’s Initiative on Race, 1998 as cited in Sue et al., 2007).

As we have looked briefly at some of the factors contributing to health disparities, we will now look at how health disparities have affected individuals and population groups.

Effects of Health Disparities

Freedland et al. (2020) have recognized that health disparities, while not new, have been exacerbated by the COVID-19 pandemic. In their words, “no other public health crisis has so rapidly and convincingly demonstrated the tragic impacts of racial and ethnic biases and other social determinants of health“(Freedland et al., 2020, p. 1021). Mental health is an important area where health disparities can be seen. Byrd et al. (2021) make a strong case for antiracist psychology that consistently identifies, accurately labels, and directly addresses racism as it is encountered. This approach can be applied in a broader sense to other populations that suffer from health disparities beyond racial and ethnic minorities. As Byrd et al. (2021) state, a crucial first step in psychology should be to recognize all manifestations of the problem.

Diverse subfields of psychology must recognize and respond to health disparities appropriately. For example, clinical psychology should prioritize research on mechanisms that explain mental health disparities while avoiding some pitfalls by including specific constructs, accounting for universal experiences, carefully considering methodology, and incorporating an intersectional lens (Adams & Miller, 2021).

Children

Effects of health disparities on children have been especially evident regarding access to education when schools were required to teach online. During the COVID-19 pandemic, many children were forced to stay at home, though in some countries there were regional differences in the regulations (e.g., in the United States it depended on the state). However, those from less affluent backgrounds had difficulty accessing or did not have the necessary computer technology (Correia, 2020). This educational shift has likely resulted in some long-term poorer health outcomes regarding obesity and vision problems, to mention just a few. The link with health is related to the fact that education is a major social determinant of health, and there have been adverse effects on children's health during the COVID-19 pandemic.

Besides poverty, most research on health disparities among children during the COVID-19 pandemic points out racial and ethnic disparities. White et al. (2021) noted that children who experience poverty and systemic disadvantage, who are more likely to be from racial or ethnic minority groups, may be at higher risk of infection, severe illness, and death from COVID-19. In vulnerable racial and ethnic groups, children are more likely to experience comorbidities that make them more vulnerable to developing COVID-19, which is due to several factors, such as: (1) the number of people per home, (2) essential jobs of parents that do not allow the flexibility of working from home, (3) a greater prevalence of underlying medical conditions, and (4) reduced access to healthcare (Kurup et al., 2021).

Ageism as a Reflection of Disparities

Most COVID-19 deaths have occurred in older people and those with chronic diseases (Hasson et al., 2021); hence, since the early stages of the COVID-19 pandemic, older adults have been considered a vulnerable population. They have been isolated even more than their younger counterparts, which resulted in a high prevalence of social isolation and loneliness in this population, paired with the fear of contracting the disease and dying. A substantial body of research on seniors during the COVID-19 pandemic has emphasized telehealth, which has often become the only option to interact with medical professionals in case of multiple health conditions that were not considered of extreme urgency (Choi et al., 2022; Zhai, 2021). Health disparities have become evident among seniors in the light of the age-related digital divide. Mental health issues among older adults, especially in the face of realizing that their peers were dying because of COVID-19, have become even more pronounced, leading some to resignation and apathy. As in other cases, the intersection of advanced age with less privilege in terms of race, ethnicity, and socioeconomic status has resulted in additional health disparities for older adults.

Racial and Ethnic Minorities

Effects of health disparities have been particularly devastating for minorities, including racial and ethnic minorities, as well as those based on gender, sexual orientation, religion, and immigration status. Minorities have historically often been discriminated against with reduced access to healthcare and greater economic disadvantage than majorities (for an example of a skin-color prejudice and its historical impact see Chavez-Dueñas et al. (2014)). Some research has pointed out a “Latinx health paradox," a finding that "Latinos actually fare better than their non-Latino White counterparts for some health issues" (Gallegos & Segrin, 2019, p. 308). However, in general, minorities tend to have less access to preventive care, and experience disadvantages related to their socioeconomic status. Minorities are disproportionately vulnerable in terms of health, from a social and financial standpoint, which increases their stress levels; at the same time, for numerous minorities mutual community support (in other words, increasing well-being from engaging in community activities, including prosocial behavior and receiving help and assistance) is of more value than in the mainstream culture, and such social bonds have been challenged by the social distancing and isolation requirements inherent to COVID-19 prevention and treatment. Recent research shows that racial and ethnic minorities continue to have lower rates of using formal healthcare compared with White patients with similar socioeconomic backgrounds and health statuses (Ma et al., 2022). However, Lee and Ferraro (2007) found that in Chicago, Illinois, second and third generation Mexican-Americans living in largely segregated neighborhoods did not show the same level of health problems as other ethnicities (e.g., Puerto Ricans) living in largely segregated neighborhoods. The investigators concluded that this difference was at least partially accounted for by a well-developed informal health care network, use of complementary and altnernative medicine, and a lay referral system (Lee & Ferraro, 2007).

Asian-Americans are frequently stereotyped as a model minority, which has led to undermining their health and marginalizing their health needs (Kim et al., 2021). This relationship between health and minority status has been well established in the United States, but also other countries with significant immigrant populations, such as the United Kingdom, where Phiri et al. (2021) noted the disproportionate impact of COVID-19 on Black, Asian, and other minority ethnic communities.

President Trump referred to the virus as the "Chinese virus" and suggested that it may have been created in a Chinese laboratory. While still the subject of some debate (Sachs et al., 2022), most scientists believe that the virus came from animals in a market. However, when anxiety is high and people feel threatened, there is often a tendency to place blame. In the early months of the pandemic, Asian immigrants and Asian-Americans were harassed and assaulted. As a social determinant, perceived discrimination against Asian-Americans was examined by Lee et al. (2002). In a sizeable Asian-American sample, they reported increased discrimination levels during the early stages of the pandemic. There was also a corresponding increase in depressive symptoms. The association was stronger among Hispanic or Latino participants when discrimination was based on race, ancestry, or national origin. Non-Hispanic Asian respondents showed this association early in the pandemic.

Afro-Caribbean-Americans reported the highest levels of discrimination compared to other ethnic groups. Latinos and Asians, however, were more likely to exhibit psychological distress as a result of discrimination. Based on a study of perceived discrimination during the pandemic, those who reported discrimination at least once a week or at least a few times a month reported moderate to severe depressive symptoms and suicidal ideation three to ten times more often in the early months of the pandemic (Lee et al., 2002). Furthermore, over half of Asian

Americans and Pacific Islanders reported experiencing discrimination during the pandemic (Lee et al., 2002).

During the early months of the pandemic, researchers compared Asian immigrants with Asian-Americans and their experiences of discrimination. A higher level of discrimination and a greater number of symptoms were reported by Asian immigrants in March 2020. However, as of April and early May 2020, Asian-Americans were more likely to report higher levels of discrimination (Wu et al., 2021). According to Lee and Waters (2021) Asian-Americans reported a 30% increase in racial discrimination during the first months of the pandemic. According to Lee and Waters (2021), this discrimination was associated with anxiety and depression.

Persons Who Are Incarcerated

Incarcerated individuals constitute populations at a higher risk for contracting COVID-19 due to their lack of control over containment strategies. The correctional facilities' administrators decide how to implement physical distancing, mask mandate, and other measures, in order to lower the viral transmission risk. Across the United States, prison administrators have chosen to suspend visitation from loved ones, education and training programs, and professional visits during the COVID-19 pandemic, although broad variation between states was detected (Pettus-Davis et al., 2021). The suspension of visits from family members and educational activities have been implemented in correctional facilities worldwide, but it is known that this could also could increase the prevalence of depression and rates of re-offending (Johnson et al., 2021). Di Giuseppe et al. (2022) note the burden of COVID-19 has been overwhelming worldwide, and outbreaks have involved both incarcerated people and staff. Their study of Italian incarcerated individuals' willingness to be vaccinated uncovered vaccine-related disparity compared with the general population. Among incarcerated persons, when asked about COVID-19 vaccination, only 19.2% reported the recommendation for vaccination by a physician, whereas 22.4% of those who would refuse vaccination indicated that vaccination had been discouraged by a physician (Di Giuseppe et al., 2022). A study from Australia points out the intersection of vulnerabilities of those in correctional facilities, concentrating on older adults, whose risk posed by a lack of physical distancing could likely be exacerbated by their frailty and mobility issues (Hwang et al., 2021). In the United Kingdom, McCarthy et al. (2022) noted that increasing vaccination coverage in older persons who are incarcerated may not just avert morbidity and mortality associated with COVID-19 but reduce reliance on restrictions (such as no or limited visitations and very limited interaction with other incarcerated persons) that have a negative impact on mental health.

Overall, it seems that when it comes to incarcerated individuals across different countries, there is a need for advocacy in terms of raising awareness about the importance of vaccination and implementing some safe measures that would yet allow them to visit with their loved ones in order to prevent deterioration in mental health. It is unclear about the extent to which prisons used technology such as Zoom to maintain contact with families from a distance.

Economically Challenged Communities

In various countries across the world, populations from lower socioeconomic status (SES) find it harder to access and take advantage of healthcare resources. This lack of engagement with healthcare, in turn, leads to a reduced willingness to actively adopt the recommendations of public health authorities (social distancing, mask-wearing, vaccination), placing these populations at an increased risk of contracting COVID-19. For example, a study in Israel found that lower COVID-19 vaccination rate was associated with lower SES and a higher active disease burden (Caspi et al., 2021). In a systematic review of racial and socioeconomic disparities in COVID-19, Khanijahani et al. (2021) conclude that economically challenged individuals are at a higher risk of the transmission of COVID-19 as they often work in professions with constant in-person interactions. As a result, people with lower incomes are more likely to experience work stress, which increases the risk of various diseases and debilitates their immune systems, in turn further increasing the risk of contracting COVID-19. Low household income is often related to housing conditions of living in small and overcrowded units, which augment health disparities surrounding infectious disease. In China, like in many other countries across the world, people living in poverty often work on daily wages and may be unemployed with no alternate source of income (Ur Rahman et al., 2021), which has increased their hardship during the strict lockdown measures. Therefore, health disparities between those with higher and lower SES have certainly had a considerable impact on the magnitude and consequences of the COVID-19 pandemic worldwide.

Mental Health Professionals and Advocacy

Addressing psychologists, Byrd et al. (2021) propose some solutions to health disparities perpetuated by racism when it comes to assessment. Their considerations could apply more broadly, thinking of other populations beyond racial and ethnic minorities, and other realms of mental health. Possible solutions should consider specific engagement and responsibilities of psychologists on various levels. At the individual level, psychologists should recognize and proactively disengage from using any offensive material or sources that would perpetuate discrimination. Each time a tool is used, in assessment, research, or practice, a professional should critically evaluate it in the light of health disparities. Mental health professionals should also expose instances of systemic racism and discrimination by approaching colleagues and leaders.

In terms of undergraduate and graduate education, psychologists should be proactive in including modules that specifically target health disparities in relation to vulnerability factors such as race, ethnicity, immigration status, gender, sexual orientation, etc. Inclusion of these topics should also be considered when teaching psychological assessment and adopting or developing mental health evaluations. Furthermore, mental health training programs should strive for equitable ways of promoting their educational offerings to diverse groups of prospective students and ensuring that graduate and professional school admission qualifications are not perpetuating bias. Some forms of diversity training/education have shown positive outcomes – such as cultural diversity training, cultural competence training, cultural safety, and cultural proficiency – as discussed in the meta-analysis by Alhejji et al. (2016). By ensuring that early career psychologists are a diversified group and represent different backgrounds, including those less privileged, we can strive for a more equitable mental health care. In line with this premise, considering all levels of impact, psychologists at all stages of their careers should engage in reflective practice and regularly self-examine the terminology that they use, their preferred tools, as well as referential bases.

In looking at the factors that contribute to health disparities, one can more easily comprehend how the effects have manifested and become a pandemic of its own. Advocacy efforts must then address these factors systematically and holistically. The focus must be on the inclusive promotion of global perspectives founded on multi-cultural viewpoints and grounded in indigenous, cultural, and cross-cultural psychologies. Simply put, advocacy efforts should put the individual, community, or population group squarely at the heart of every program or policy. One way to accomplish that is to operationalize the tenets and fundamental principles of International Psychology (IP). IP can be defined in many ways; however, its fundamental principles are based on the acknowledgement and respect for intercultural interactions (Stevens & Wedding, 2004). IP is not considered a “hard science” when compared with clinical, industrial, or forensic psychologies. It is aspirational, participatory, inclusionary, experiential, and contextual. Unlike most fields of psychology, IP can be easily taught, readily adapted, promptly utilized, and is applicable to a variety of areas, situations, and circumstances found in local, national, and international spaces. It is a field of psychology that can be utilized by companies, corporations, organizations, institutions, agencies, and individuals alike. The field and its practitioners are uniquely qualified to advocate, conduct research, engage in international activities, and operate within a culturally contextual environment. The potential applications are endless and should be considered among others when seeking methods of engagement.

Advocacy efforts can benefit from an international perspective on mental and physical well-being. It calls for the inclusion and involvement of members of the affected population group in any discussion, planning, or implementation of solutions, resolutions, programs, and policies that would impact them. After all, who would know best the needs of a group other than members of the group itself. Too many times advocacy efforts are focused on what someone outside of the affected group believes is the right solution. Operationalizing international psychology principles can transform advocacy efforts by allowing them to focus on the promotion of social justice, embrace indigenous psychologies, and recognize the need for participatory action and collaborative efforts to address challenges.

Participatory action can be seen as the synthesis of objective and methodical research coupled with educational awareness and political action (Encyclopedia of Sociology, 2022). Using this informal definition of participatory action, standards of advocacy should rest upon five (5) tenets, which can also be found in IP research and practice. These tenets include the following: (1) the inclusion of the affected population group in determining programs, policies, and solutions, (2) the identification of positions of power and authority, where they are located in comparison to the affected population group, and how the group can be empowered to act on their own behalf, (3) the deliberate and strategic plan to raise awareness of the issues and provide educational opportunities that elevate the voices of the affected group, (4) the ability to be culturally sensitive and responsive to the traditions, beliefs, and global understandings of the affected group, and (5) the willingness to engage collaboratively with stakeholders on various levels to bring about positive political action. When advocacy efforts rest upon these tenets, communities are empowered, discriminatory policies can be disassembled, and disparity gaps can be decreased. This approach to advocacy fulfills the United Nations Sustainable Development Goal (UNSDG) #10, to reduce inequalities within and among countries (United Nations, n.d.).

The discussion of health disparities is not complete without including the United Nations Sustainability Goal #3, to ensure healthy lives and promote well-being for all at all ages (United Nations, 2023). Conversations about health and well-being for all include recognition and acknowledgement that all people, regardless of race, creed, religion, gender, age, or sexual orientation, are entitled to good health and the ability to pursue a productive lifestyle. It is further acknowledged that the former cannot be attained in the midst of a "*high prevalence of debilitating diseases*" (UNSDG, n.d.).

Conclusion

In order to decrease gaps in health disparities, it is critical to understand the factors that have led to those disparities and the effects that they have had upon individuals, communities, and population groups. Advocacy efforts must address these effects and work collaboratively to formulate strategies to reduce them at every level. The causal factors discussed in this chapter that contributed to health disparities did not happen overnight and it is naive to believe that they will be resolved quickly and without consistent and persistent work. It is only with understanding, acknowledgement, and committed dedication from all identified stakeholders that the gaps in health disparities will be bridged and brought into equitable alignment. The call to action should be one that is loudly proclaimed throughout the land in hopes of being not just heard but acted upon.

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Chapter 6
Healthcare Disparities: Vulnerable and Marginalized Populations

Falu Rami, LaShawn Thompson, and Lizette Solis-Cortes

A Historical Overview of Health Disparities

According to the World Health Organization (WHO) (World Health Organization [WHO], 2022a, b, c), global life expectancy, the average expected life period, and healthy life expectancy (HALE), as well as Quality of Life Years (QALY), which considers the quality of life while living, had been increasing internationally. There is recent evidence that the COVID-19 pandemic negatively affected both health and life expectancy globally and in some countries stopped or reversed recent gains in global health (Scholey et al., 2022). There is evidence that this reversal had begun in the United States before the pandemic's onset. Before the COVID-19 pandemic, mortality reductions due to maternal and child health and communicable diseases such as human immunodeficiency virus (HIV), tuberculosis (TB), and malaria were documented globally. However, life expectancy and HALE remain a decade lower for low-income countries in the Global South with one-half of all deaths in Global South countries caused by communicable diseases. These facts indicate that even though global health has improved over the last decade, regional differences remain

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when comparing life expectancy and health gains of populations that differ on socioeconomic levels. These notable differences in health between people are referred to as health inequalities or health disparities (WHO, 2022a, b, c).

Health Inequalities, Health Inequities, and Health Disparities

Before an overview of global health disparities is presented, discussing some general terminology is beneficial. Health inequality and health disparity are defined as differences measured in health between individuals or groups (Kawachi et al., 2002). We measure these differences between population groups by tracking disease incidence rates, prevalence, mortality, the burden of disease, and any other adverse health conditions. The incidence rate and consequences of specific illnesses or decreased healthcare are disproportionately more significant in some people than in other groups (U.S. Department of Health and Human Services, 2017).

According to Kawachi et al. (2002), the definition of health inequality should be devoid of any moral or judgmental implications as it is simply a term referring to measurable quantities. An example of inequality would be if higher levels of disease X are measured in group A compared to group B. If disease X is equally distributed and calculated at the same rate in the population, no health inequality exists (Kawachi et al., 2002). Because inequalities are considered devoid of any additional judgment statements attached to the differences, health differences can be viewed as just and fair. Fair inequalities are health differences due to pure chance, random genetic mutations, life stage differences, and personal choices. For example, person A may succumb to a car accident or from the consequences of an unhealthy lifestyle. In this example, the observed differences in person A's life expectancy or HALE are just and fair compared to others in similar life circumstances.

A term often confused with health inequality or health disparity is the concept of health inequity. Health inequity is defined as a measurable difference in health between individuals or groups that can be attributed to unjust or unfair circumstances. These differences may include ethnicity, race, socioeconomic status, and any other personal or community identifier that creates a socially disadvantaged situation having the potential to contribute to decreased optimal health (Graham, 2004). Inequity is not confined to racial and economic groups. Inequities may occur related to gender, sexual orientation, age, geographic location, disability status, and physical ability. In addition, immigration dimensions may potentially contribute to health inequities (U.S. Department of Health and Human Services, 2017).

An example of health inequity is the current maternal death rate in the United States. Non-Hispanic Black women's maternal deaths are 2.9 times higher than the maternal death rates for Non-Hispanic White women and Hispanic women in the same year (Hoyert, 2022). In addition, in 2020, Non-Hispanic Black women were three to five times more likely to die in childbirth when compared to women of other ethnicities. Growing research indicates that quality of healthcare and access to healthcare may be the unjust circumstances at the root of this health inequity

(Howell, 2018). In short, health inequity occurs when individuals or groups of people who share one or more social or physical identifiers experience systematic health differences because they occupy an unequal position in society. As such, the causes of health disparity can be rooted in health inequity, making the measured differences in health unfair (Graham, 2004); however, as shown above, this is not always the case.

Terminology is further complicated by differences in the use of these terms between countries and regions. Some countries do not have separate terms and use these terms synonymously, which makes a global discussion on disparity, inequality, and inequity very difficult. Non-conformity of term usage also exists between the scientific communities that study these concepts and agencies that create public policy (Health Inequalities, 2021). Even agencies based in the same country and governing processes have differences in how these terms are defined and used. For example, the National Institute of Health (NIH) defines disparity as a difference in the incidence and prevalence of disease in populations within the United States (Meghani & Gallagher, 2008). At the same time, the Centers for Disease Control and Prevention (CDC) of the United States defines a health disparity as preventable differences responsible for reduced optimal health opportunities usually experienced by disadvantaged populations, groups, or communities.

The traditional definition of health disparity or health inequality leans toward understanding that a disparity may be preventable or non-preventable but can still be fair and just. The CDC's non-traditional definition lends itself to a broader definition of disparity, suggesting that disparities are preventable, possibly through social policy, and experienced by disadvantaged populations due to social injustices. The CDC further labels a health disparity as inequitable and directly related to the historical and current unequal distribution of social, political, economic, and environmental resources (Centers for Disease Control and Prevention, 2008). The latter and more liberal definition of disparity incorporates disparity (inequality) and inequity terms. Additionally, concept models dating back at least four decades describe disparities as the over-arching difference in health, with inequality measured as a value-free (fair) difference and inequity measured as a value-laden (unfair) difference (Meghani & Gallagher, 2008).

This chapter will define measured health differences, inequality, and inequity as health disparities. It is beyond the scope of this chapter to fully unravel the complexity of these terms as they are used globally and selectively by various agencies worldwide. The point here is to bring an understanding of the basic terms and to highlight the complexity of understanding global health disparities.

Historical Overview of Health Disparities in Europe

Disparities have been documented for hundreds of years, with the earliest records originating in Europe. In the 1700s, the high incidence rate of breast cancer in nuns was reported in Italy, and soon after, the high frequency of scrotal cancer in chimney sweeps in Britain (Gibbons, 2005). There was discussion that the cause of these disparities was related to social and environmental risk factors (Gibbons, 2005); in short, these disparities were unjust and potentially preventable. By the mid-nineteenth century, Edwin Chadwick, a British civil servant, and statistician, hypothesized that the differences in mortality rates between the social classes in Liverpool, England, were due to poverty and lifestyle factors (Gibbons, 2005). Additionally, in Germany, physician Rudolph Virchow called for a shift in the medical field from focusing on changing the individual to changing society to combat diseases traceable to societal deficiencies (Gibbons, 2005). In France, recommendations were made to improve educational or working conditions to reduce health disparities. More recently, Britain boasted the first attempt by a national government to systematically study, understand, and explain health disparities through a health committee formed in 1977 (Gibbons, 2005).

Europe has long since documented health disparities and called for a refocus on society and policy's role in overall health (Gibbons, 2005). However, official recognition of health disparities in the United States did not occur until 1984, when the United States Department of Health and Human Services released a report indicating disproportionate illness and mortality in African-Americans and other marginalized Americans compared to the overall population. By the 1990s, it became apparent in both the United States and Britain that societal and environmental determinants of health were related to the quality of healthcare received (Gibbons, 2005).

Healthcare Disparities: United States, Canada, Latin America, Mexico, and the Caribbean

Much like the United States, Canada only began to fully understand the issue of health disparities in the early 1980s when evidence of inequalities due to socioeconomic factors was outlined by the Canadian Institute for Advanced Research (Glouberman & Millar, 2003). The Institute's report may have been the first Canadian governmental report documenting social factors outside the healthcare system as health determinants (Graham, 2004). Five decades later, Canada's latest report still emphasizes low life expectancy and infant mortality among their citizens living in lower-income locations. In addition, the Canadian government does recognize high incidences of multiple health conditions and premature mortality, specifically affecting First Nations and indigenous peoples (Statistics Canada, 2018).

Although Mexico has worked successfully to increase life expectancy since the 1940s, by the 2000s, health disparities remained directly linked to income status and geographical residence, ensuring inequalities persisted in health and access to healthcare (Barraza-Lloréns et al., 2002). There has been an upward trend in researching health disparities in Latin America and the Caribbean since the 1970s, peaking in published research between 1994 and 2000 (Almeida-Filho et al., 2003). Despite a long history of disparity research and attention, many Latin-American countries still document disparities in particular populations such as women/girls; the lesbian, gay, bisexual, transgender, and queer (LGBTQ+) community; indigenous persons; ethnic minorities; migrants; and refugees on top of a continued financially strained healthcare system (Ruano et al., 2021).

Healthcare Disparities in Africa, the MENA, and Asia

When comparing the countries on the continent of Africa to other countries globally, evidence shows a heavy burden of disease and decreased life expectancy (Anaemene, 2017). Although WHO has been active with a multitude of initiatives to reduce health disparities on the continent since the 1950s, problems persist. Circumstances such as poor healthcare systems, constrained resources, emerging and re-emerging infectious diseases, natural disasters, access to clean water in some countries, and military conflicts continue to plague the continent. In addition to these socioeconomic determinants of health, research shows that over 50% of the African population have little to no access to modern healthcare facilities, with most facilities located in urban areas (Anaemene, 2017). Regarding Middle Eastern and North African (MENA) countries, life expectancy has improved over the last few decades; however, disparities exist between urban/rural areas and low/high-income levels (Boutayeb, 2015).

South Asian regions saw an interest in health inequity around the early twentieth century, with the earliest documentation of disparities in the late nineteenth century; however, it was not until the 1940s and 1950s when international organizations such as WHO began to enact health initiatives (Amrith, 2014). Currently, most Asian countries/regions are experiencing an increase in life expectancy and a decrease in infant/maternal mortality, which correlates with economic growth in those countries. Life expectancy in many Asian countries has increased by at least 6 years for those in the low- to middle-income categories (Organisation for Economic Co-Operation and Development [OECD]/WHO, 2020). Unfortunately, south Asian regions have the opposite occurring with a decreased level of life expectancy and an increased level of infant/maternal mortality documented, especially in indigenous persons (Thresia, 2018; Thresia et al., 2022). Moreover, some disparity is still shown in the premature death of female child and adolescent populations in Asian and south Asian regions (Kennedy et al., 2020). The complexity of inequalities in these regions cannot be reduced to life expectancy rates. Within Asian countries, there are often multiple cultural, religious, and ethnic differences; country-wide statistics mask disparity by region, location, socioeconomic categories, gender, social standing, and other determinants (Friel et al., 2011).

Until the start of the Covid-19 pandemic, data showed an average global health and life expectancy increase (WHO, 2022a, b, c). However, as outlined above, a closer inspection of the evidence shows varying levels of health disparities between regions and populations. As we move toward understanding health disparity globally, we must look at the past and recognize the progress while also acknowledging the need for further research, additional health policy, and investment in global healthcare initiatives to combat health disparities worldwide. The following section provides an overview of selected disenfranchised populations.

Who Is Disenfranchised? An International View

In 1948, the United Nations created an initiative to understand global health. Consequently, this initiative led to the establishment of the World Health Organization (WHO). Today, WHO directs the collaborative efforts of over 150 countries globally. WHO's mission consists of instituting global health initiatives, responding to global emergency crises, preventing disease, promoting well-being, and expanding global healthcare. Since its beginning, WHO has provided a global view of health. This global view of health consists of tracking overall international health and well-being. In addition, WHO monitors ongoing and new disease incidence rates and populations affected in nearly all countries. Another essential service is collecting world health information, such as statistics on the prevalence and incidence of specific illnesses by country (World Health Organization, 2022a, b, c). WHO also alerts healthcare professionals when new arise or previously controlled diseases reoccur.

So, who are the populations of individuals that become disenfranchised through health disparities? To answer this question, we must first understand how individuals become disenfranchised. To become disenfranchised means that a particular population or individuals within that population have become excluded or alienated from their potential for optimal health due to some circumstances. In other words, something or someone presents itself as an obstacle to good health or, at the minimum, good healthcare practices.

Worldwide, the determinants of health tend to fall into four categories: individual characteristics, behaviors, physical environment, and socioeconomic environment (World Health Organization, 2017a, b). Conditions such as poverty, geographic location of residence, low resource environments, decreased access to care, and reduced care utilization can contribute to health disparities that lead to disenfranchisement (The National Academies of Science, 2017). In addition, individual identifiers such as race and ethnicity, sex, age, language spoken, disability status, and genetic makeup may also be associated with health disenfranchisement. Contained in some of these overarching conditions are additional variables of interest. For example, healthcare access can be broken down into whether healthcare is available. However, access also includes whether health services are convenient and affordable (The National Academies of Science, 2017).

Social Determinants of Health

As mentioned at the beginning of the chapter, determinants of health can cause disparities that are fair, health inequalities, and those that are unjust, health inequities. Health disparities caused by individual characteristics and diseases that originate from genetics and behaviors such as unhealthy life choices (smoking, drinking, unbalanced eating, and harmful stress levels) may create disparities; however, those disparities are considered fair. In the case of genetics, it is a fair and just disparity because genetic makeup is typically not preventable or caused by the individual or society but is, instead, due to chance (Kawachi et al., 2002). For example, a disproportionate number of individuals diagnosed with inheritable diseases carry the burden of this disease compared to others who are not genetically predisposed. Their health may be affected negatively due to genetics; however, the disparity is fair. Behaviors that lead to a deterioration in health, such as cigarette smoking, are often viewed as distinct from disparities because individuals maintain autonomy and responsibility over their actions (Kawachi et al., 2002).

Although it may be a worthy endeavor to attempt to decrease health disparities due to predisposition to disease and healthy choices, most current research and initiatives focus on differences due to societal systems or policy. Social determinants of health are the factors outside the healthcare system that positively or negatively affect health outcomes (WHO, 2022a, b, c). These factors include economic policies/procedures, development agendas, social norms, and political systems. Some examples of social determinants of health include income/social protection, education, unemployment/job insecurity, working life conditions, food insecurity, housing/essential amenities/the environment, early childhood education, social inclusion/non-discrimination, structural conflict, and access to affordable health services of acceptable quality (WHO, 2022a, b, c). According to WHO, social determinants account for 30–55% of health outcomes and are more important than genetics, healthcare, or lifestyle choices (WHO, 2022a, b, c). Data such as these will hopefully prompt governmental agencies and international organizations to move away from focusing on individual characteristics and behaviors to a focus on societal factors to decrease disparity and improve overall health.

However, we must remember that we can understand these social determinants of health by grouping individuals and populations into categories—such as sex, race, type of employment, or neighborhood. Grouping populations helps us detect specific patterns of disparity. By using specific individual identifiers, behaviors and physical and socioeconomic environments can be categorized and assessed with social indices. Researchers can then comprehensively and quantitatively depict those experiencing disenfranchisement. Kawachi et al. (2002) indicate that studying these social group differences is essential so we do not disregard crucial economic and political relevance in health disparities. The following section examines individual identifiers and contributors to social determinants of health.

Social Determinants of Health: Ethnicity, Gender, Immigration, and Socioeconomic Status

Individual identifiers such as race/ethnicity, sex/gender, gender identity, age, language, disability status, immigration status, and refugee status (Healthy People 2020, 2022) are used to form a picture of those experiencing health disparity. Moreover, when we group populations using these identifiers, we see patterns of difference emerge. For example, in China, discrepancies related to ethnicity have been documented from the 1980s, with ethnic minorities in China carrying the burden of decreased health, increased mortality, and reduced life expectancy (Wang et al., 2020). The health disparities in China are due to the intersectionality of ethnicity and socioeconomic status; ethnic minorities in China also have a higher probability of living with lower education and income (Wang et al., 2020).

However, there are not always intersections with other social determinants to explain the disparity in ethnic and social groups. According to the Centers for Disease Control & Prevention (2021), in the United States, ethnic minority groups experience a higher level of illness and death when compared to the overall population. Centuries of racism are one underlying cause of disparities between ethnic minority groups and the general population. Moreover, as countries become wealthier and more developed, healthcare disparities remain consistent, especially in the child population. These findings suggest inequities outside wealth and access (Rebouças et al., 2022). Racism also can shape the health behaviors of ethnic minorities, specifically Non-Hispanic Black Americans (Bajaj & Standford, 2021). Experiencing racism daily in healthcare in the United States results in decreased levels of trust in the medical field, ultimately shifting behaviors away from seeking healthcare in this population (Bajaj & Stanford, 2021).

Health disparities are also evident and documented when examining gender and sex. Upon first thought, there may be a reason to believe this issue should not be connected to societal determinants because sex differences in care should mostly center on the biological differences between the female and male body (Cislaghi et al., 2020), but this is not the case. Patriarchal social practices may be the source of disparities in health for women and girls globally. In South Asia, persons born female experience discrimination at each stage of life development leading to poorer health (Fikree & Pasha, 2004). Discrimination begins with infant mortality in the form of sex-related selective abortions, and developmentally, then moves to the neglect of female children, and later to reduced access to healthcare and more significant reproductive mortality (Fikree & Pasha, 2004). Gender-related health disparities are also evident for nutritional disease, self-harm, and interpersonal violence (Kennedy et al., 2020). These health disparities extend not only across lifetimes but also are multi-generational due to the continuation of restrictive and harmful gender roles, values, and societal expectations (Kennedy et al., 2020).

Since the mid-1960s and peaking into the 1970s, health-related poverty research has been available. However, the first research on the subject happened in the early 1900s (Klingelhöfer et al., 2022). Studying poverty can include addressing social determinants of health, such as socioeconomic environments centered on income, education, and poverty levels, including comparisons of the Global North and Global South in healthcare affordability, economic and educational resources, and employment opportunities (Healthy People 2020, 2022). In addition, hunger, malnutrition, and lack of power in decision-making differ internationally (Rebouças et al., 2022). In many countries, children experience and are most affected by social determinants of health linked to poverty as inequities such as morbidity, mortality, and development (Spencer et al., 2019). Moreover, health inequities in children occur between and within countries, though vast differences exist between low-income, middle-income, and high-income countries (Spencer et al., 2019). Global trends indicate higher infant mortality rates in low-income families (Spencer et al., 2019).

Furthermore, some global data indicate that in developing countries of the Global South, roughly half of child mortality occurs before age five (Amouzou et al., 2014). However, the lack of international collaboration in gathering epidemiological data contributes to obstacles to alleviating the risks involved. It seems that high-income countries often complete domestic research on poverty, leaving low-income countries outside of data collection as there are usually minimal funds allocated for research on international income differences (Klingelhöfer et al., 2022).

Urban-Rural Divide and Social Determinants of Health

Socioeconomic determinants of health are intricately linked to physical environments. Social determinants, such as the geographical location of residence (with an emphasis on urban and rural), availability and convenience of accessing healthcare, water quality, air quality, healthy living situations (Healthy People 2020, 2022), such as neighborhood walkability, recreational areas, and accessibility of healthy foods (Braveman & Gottlieb, 2014), safe housing, safe roads for transportation, and community resources fit into this category. For example, rural-urban differences in healthcare are often evident. Rural areas of residence often do not have access and resources to several vital social determinants identified for positive health. These rural-urban differences include availability/accessibility of healthcare, community support resources such as playgrounds or organizations for senior citizens, and transportation. Currently, over three billion people live in rural locations globally, with Africa and Asia home to nearly 90% of the world's rural population (United Nations, 2018).

Global data from 174 countries indicated that 56% of the global rural population lacks healthcare coverage compared to only 22% of urban populations (Scheil-Adlung, 2015). Internationally, this disparity is greater in Africa. Furthermore, there are seven million fewer healthcare workers in rural regions compared to three million in urban areas, impacting the delivery and quality of services provided. Additionally, rural regions have 2.5 times higher rates of maternal mortality when compared to urban locations (Scheil-Adlung, 2015). Finland, Norway, and Sweden have documented higher mortality rates in rural regions (Bremberg, 2020), and 30% of Australians who live in rural or remote areas experience poorer health and less access to healthcare professionals and services (Barclay et al., 2018). Even in well-developed countries such as the United States, access to care in rural areas creates disparities, specifically, access to primary doctors, specialists, and health information (Chen et al., 2019). The rural-urban divide exists within nearly all countries and regions, and place of residence significantly affects coverage and access to healthcare (Scheil-Adlung, 2015).

Observing the social determinants of health is essential as it may assist in alerting policymakers to populations that have been disenfranchised due to health disparities. The goal of this portion of the chapter was to provide examples of disenfranchised people from a global perspective, not to give an exhaustive listing of populations suffering from each social determinant. In addition to social determinants of health, another critical factor that marginalized communities face includes the entrenched impact of structural violence.

Structural Violence

John Galtung invented the term structural violence to describe how the interaction between social structures and systems (political, economic, housing, legal, religious, educational, and cultural) result in oppressing and causing harm to marginalized and vulnerable groups, individuals, and communities (Galtung, 1969). Structural violence typically causes injury to those who are not responsible for perpetuating such inequalities. Several examples of structural violence include unfair and inequitable access to and distribution of resources to marginalized and vulnerable groups, individuals, and communities that create barriers to achieving their full potential. The intersectionality of the identities of these groups includes age, sex, gender, race, ethnicity, nationality, legal and political status, class, socioeconomic status, and religion, to name a few.

These marginalized and vulnerable groups have less access to multiple factors known to be related to health: healthcare, safe housing options, equitable education, and employment opportunities. Their legal status also contributes to higher incarceration rates than the general population, often supported by national policies to detain immigrants, migrant workers, refugees, and asylum seekers (Ryo & Peacock, 2020; Saadi et al., 2020; von Werthern et al., 2018). Similarly, many homeless individuals and those incarcerated have severe mental illnesses compounded by substance abuse issues and are victims of structural violence (Al-Rousan et al., 2017; Fazel & Seewald, 2012). Fazel and Seewald (2012) conducted a systematic literature review and regression analysis of 109 samples of 33,588 prisoners from 24 countries. Their findings showed a high prevalence of psychiatric diagnoses in detained individuals, internationally. The number of detained individuals has steadily increased over the years, with the United States detaining the most individuals worldwide. In addition, these carceral communities are at greater risk of contracting COVID-19 and dying from it.

Some examples of other marginalized groups include Black, Indigenous, and Persons of Color (BIPOC) migrant workers, refugees, immigrants, the homeless, and the chronically mentally ill. However, these descriptors do not provide a complete and exhaustive list of all marginalized groups. In addition, factors such as inequities between and within countries and access to resources should also be considered when viewing structural violence. For example, indigenous groups (Brazil, India, the United States), or migrant workers (India, the United States), may experience multiple forms of structural violence.

Mass Incarceration and Detainment of Immigrant, Migrant Workers, and Asylum Seekers

The growth in migration trends over the past few decades has led to an increase in anti-immigrant and refugee/asylum seeker policies passed and enforced domestically in the United States and globally (von Werthern et al., 2018). In addition, due to the onset of COVID-19, the Trump administration used the public health crisis and fear of COVID-19 to pass various policies that significantly impacted immigrant communities with an agreement formed with the Mexican government, titled the Migrant Protection Protocol (MPP) (remain in Mexico). Trump also passed the Public Charge Rule, whereas immigrants seeking residence could be punitively denied access to residency if they had used certain public services or government benefits. Immigration policies were passed by the Trump administration that created an impenetrable anti-immigrant foundation. Building on this foundation, infrastructures, and systems paved the way to expand immigration detention, demolish refugee support centers, and defunded asylum seeker agencies. Together, these practices resulted in significantly lower resettlement numbers than in the prior administration. In addition, agencies are still reeling from previous funding restrictions as they struggle to hire staff and provide services to the most recent refugee populations (Ryo & Peacock, 2020; Saadi et al., 2020). The significance of these acts, including the negative, unwelcoming rhetoric that the Trump administration used to describe immigrants and refugees, instilled fear in these communities and made them increasingly fearful of accessing healthcare resources. Because of fear of retaliation and limited legal status, recent immigrants were reluctant to receive vaccinations, COVID-19 tests, and other services (Ross et al., 2021).

As documented by Ryo and Peacock (2020), the detention of immigrants, migrant workers, and asylum seekers increased exponentially from 1973 to 2019. During these years, average daily U.S, detention rates steadily grew from 2370 to 55,000 immigrants despite a drastic drop in national unauthorized immigration rates between 2007 and 2017. Concurrent with these trends, small to mid-sized and rural Republican counties in the southern United States detained higher rates of immigrants between 1983 and 2013. Rural areas create substantial barriers to accessing adequate health and legal resources with a deleterious impact on social determinants of health, increasing structural violence for immigrants, migrant workers, and asylum seekers and increasing their mental and physical health risks (Ryo & Peacock, 2020). Furthermore, private prisons and jails received sizable financial incentives and payments from Immigration and Customs Enforcement (ICE) to detain immigrants, migrant workers, and asylum seekers, resulting in higher detention numbers and average days spent in jails and private prisons (Ryo & Peacock, 2020). These actions are widespread in private prisons such as those run by the Geo Group and CoreCivic, where the detained spent 82% more days compared to other jurisdictions. It is also important to note that these trends also existed in rural areas with fewer health and legal resources and less public scrutiny.

Some other attributable causes of mass detention surges and structural violence include the 1996 Antiterrorism and Effective Death Penalty Act and the Illegal Immigration and Immigrant Responsibility Act. Together these acts created a rationale for minimum detention rates for those with lesser offenses and allowed the conviction, detainment, and deportation of vulnerable immigrants, migrant workers, and asylum seekers (Saadi et al., 2020). Detained immigrants and asylum seekers are particularly vulnerable due to their legal status and limited health and legal resources. COVID-19 put these groups at additional risk in crowded units where they were more susceptible to infection and premorbid conditions impacting COVID-19. In addition, their migratory journeys often placed them at other mental and physical health risks. It is well documented that prisons, jails, and detention centers have some of the country's highest COVID-19 infection and mortality rates. Staff members who work in these settings with access to the outside world may carry COVID-19 infection and spread it to those detained. The crowded conditions can make these settings "superspreaders."

Another example of structural violence is the current trends and collaboration in detention centers between powerful agencies such as ICE, immigration courts, and the Department of Homeland Security (DHS). In addition, Congress has increased funding for many contracts given to private prisons such as the GEO Group and CoreCivic (Goodman, 2020; Saadi et al., 2020). In these for-profit incarceration centers, detained immigrants and asylum seekers have fewer resources and protections for legal representation. This deficit has been exponentially true during COVID-19, which resulted in increased mass backlogs of court hearings. Additionally, Migrant Protection Protocols (MPP) resulted in asylum seekers being held in Mexico without opportunities for legal representation (Saadi et al., 2020).

The United States is home to the world's most extensive immigration detention system (Saadi et al., 2020), detaining individuals in 200 immigration jails in 2018. During this same period, the daily incarceration rate was 42,000 people. The highest detention rate was in 2019, with an increase of 55,000 individuals detained daily—the highest figure in U.S. history. These trends coincide with the rise in private detention centers across the United States, where more than 70% of detained immigrants are held (Freedomforimmigrants.org, 2022). The top two private immigration detention ICE contractors are the GEO group, granted $184 million, and Corrections Corporation of America/CoreCivic, granted $135 million in 2017. These figures highlight an association between anti-immigrant and asylum seeker state and federal policies, ICE, private detention centers, and justification due to the profit associated with mass detention of immigrants and asylum seekers. Similarly, under the Trump administration, immigrants were detained for extended periods and had higher rates of deportation by ICE without a fair trial. The individuals that Freedom for Immigrants, a legal aid service, works with, on average, are arrested for longer than a month; 48% of their clients were detained for an average of 2–4 years (Freedomforimmigrants.org, 2022).

Furthermore, the lack of accountability, transparency, communication, and disjointedness of critical agencies managing the immigration detention system provides fertile ground for increased human rights abuses (Freedomforimmigrants.org, 2022; Ryo & Peacock, 2020; Saadi et al., 2020). The Office of Refugee and Resettlement (ORR) oversees the detention of children and unaccompanied minors, while Customs and Border Protection (CBP) and ICE are part of DHS and oversee adult detention. Fragmentation and inequitable healthcare services (physical and mental health) are apparent in all these agencies. For example, ORR contracts with private entities to provide services to unaccompanied minors in emergency shelters, long-term foster care, and residential centers. The quality of care and services in each of these settings varies per provider, agency, and foster care are often out of compliance with the Flores Settlement Agreement detaining unaccompanied minors for much more extended periods than stipulated. Similarly, incarcerated adults receive disparate healthcare, as evidenced by 25% of detainees receiving care from the ICE Health Service Corps and others receiving direct services through for-profit contractors. The following section discusses alternate means that different countries used to combat their COVID-19 statistics and factors influencing these rates.

International Responses to the Pandemic: COVID-19 Rates

Government, media agendas, and ruling political parties often influence how COVID-19 statistics are interpreted and reported (Karamouzian & Madani, 2020; Rami, 2018). In the case of COVID-19, the presidents of Brazil (Bolsonaro) and the United States (Trump) have downplayed the prevalence and fatality of the virus (Ortega & Orisini, 2020). The latter, coupled with populist leadership and attacks on science, has resulted in fragmented responses and exacerbated preexisting psychosocial issues in already vulnerable regions such as Brazil's favelas and indigenous areas and the U.S. South and Great Plains states (Aizenman, 2020).

On the other hand, disparate and disjointed responses in the Middle East and North Africa (MENA) regions are a function of sociopolitical issues that influence the effective containment of COVID-19 (Karamouzian & Madani, 2020). For example, challenges and barriers include disparities between socioeconomic groups, access to public healthcare facilities, and resources; the influx of refugees due to forced migration; and tensions and conflict between groups due to ethnic, political, and religious affiliations (Karamouzian & Madani, 2020). Furthermore, internal and external support from Non-Governmental Organizations (NGOs) and the World Health Organization (WHO), COVID-19 response in the MENA region has been hampered due to logistical and financial challenges. This inconsistent support is partially demonstrated through a lack of testing availability and resources to provide accurate data in low- and middle-income countries (LMIC), which are likely reflected in artificially low infection rates (Karamouzian & Madani, 2020).

COVID-19 infection rates could also be influenced by the international community's view of a particular country. The negative perception of Iran by some countries and sanctions against it by the United States resulted in multiple barriers to curtailing the pandemic infection rates (Jahanshahi et al., 2020). For example, Iran had various consequences related to an early influx of COVID-19. Nineteen cases were exacerbated due to the severe sanctions imposed on the region, limiting the ability to diagnose, treat, and provide prevention measures. Cultural factors also play a role in how communities and countries have combated the virus. Specifically, research suggests that social distancing requirements and the ability to engage in other public health protocols depend on available resources such as adequate sanitation and water access. These factors have been a primary concern in Brazil and India (de Oliveira Andrade, 2020; Gopalan & Misra, 2020). Brazil and India currently have the world's second and third highest infection rates (Dias Jr. & Verona, 2020; Worldometers, 2020). The suggested guidelines for reducing COVID-19 infection rates are often unattainable by individuals of lower socioeconomic status (SES) due to a lack of access to healthcare, protective equipment, and substantial income reduction (Gopalan & Misra, 2020; Klôh et al., 2020; Richmond, 2020).

Additionally, the pandemic has had dire consequences on the global economy. However, the effects have been more significant for people from lower SES backgrounds and individuals who work in the informal sectors because it has affected multiple domains of their lives (Gopalan & Misra, 2020; Richmond, 2020). These groups also have limited labor protections and/or restrictive healthcare access. There are significant geographical, racial, and ethnic disparities within countries. The most vulnerable and at-risk groups impacted include those from the lower SES working in the informal sectors or undocumented immigrants, or migrant workers (Gopalan & Misra, 2020; Richmond, 2020). The conglomerate of sociopolitical issues related to COVID-19 have had harmful mental health consequences. Additionally, refugee and immigrant communities face a disproportionate impact of COVID-19 effects, with issues of poverty, limited access to healthcare, and fear of legal repercussions placing already vulnerable immigrant communities at increased risk of further harm (Clark et al., 2020; Page et al., 2020; San Lau et al., 2020). A particularly vulnerable group among immigrant communities at risk of COVID-19 due to their occupational duties and their legal status are migrant workers.

International Migrant Workers

There are over 150 million international migrant workers that have been documented. Of these international migrant workers, 95% reside in five WHO regions with confirmed COVID-19 cases (Liem et al., 2020). Globally migrant workers are among the most vulnerable and marginalized groups, have significant healthcare barriers, and lack access to resources (Alahmad et al., 2020; Liem et al., 2020). Migrant worker risk factors include (1) group exclusion from public protection policies, (2) taking jobs with an increased risk that involves working long hours and decreased pay, and (3) working in positions that include significant cultural and language barriers. In addition, because migrant workers have limited legal status, they are at increased risk of contracting and being infected with COVID-19, stranding them in foreign countries, and depleting any existing financial and social support resources.

Migrant workers are at higher risk of contracting COVID-19 due to their limited legal status, living in hazardous housing conditions, conducting work that increases the risk of contracting COVID-19, lack of access to adequate healthcare and other resources, and low socioeconomic status (Alahmad et al., 2020). In addition, international migrant workers often do not have access to public health messaging on ways to curtail COVID-19 and are subject to receiving misinformation that creates fear and panic (Liem et al., 2020). Similar risk factors for migrant workers have been documented in various contexts, including Singapore, India, Kuwait, and Europe, which host large migrant worker populations (Alahmad et al., 2020; Fasani & Mazza, 2020; Koh, 2020; Liem et al., 2020; Suresh et al., 2020).

Global Trends for Agribusiness and Migrant Workers

Adequate living wages have been a global concern impacting individuals from marginalized and vulnerable backgrounds and work sectors (Global Living Wage Coalition [GLWA], 2020). Individuals in the agribusiness sectors that provide essential agricultural services as migrant farm workers are increasingly at risk due to the current COVID-19 pandemic (Sepkowitz, 2020). Essential workers include individuals that work in the agribusiness sector, such as migrant and local farm workers and line workers in meat packing plants. Agribusiness employ up to 200 million farmworkers globally. Svensson et al. (2013) report that according to the International Labour Organization (ILO), there are 1.3 billion workers that provide services in the agricultural sector worldwide. In certain U.S. regions, such as California, 90% of agricultural workers are migrants. Therefore, the terms agricultural workers and migrant farm workers are used interchangeably in the following discussion.

Migrant farmworkers that provide essential services in the United States are particularly vulnerable. Many migrant farm workers are undocumented and come from

Mexico (Fitch et al., 2017). Reports suggest that there are an estimated 3–5 million seasonal and migrant farmworkers in the United States (Hansen & Donohoe, 2003). Migrant farmworkers represent 80% of workers that assist in providing the food supply in the United States, and up to 50–75% are undocumented (Fitch et al., 2017). It is important to note that these statistics may only reflect migrant farm workers identified and are likely to be underestimated. Given these statistics and vulnerability factors for migrant farm workers, it is essential to consider their living wages and their vulnerability to COVID-19 (Anker, 2011; GLWA, 2020).

Vulnerabilities Experienced by Agricultural Migrant Workers in the United States

The United States has approximately 2.5 million agricultural workers who have been declared “essential workers” during the pandemic. They are vital in the wholesale food industry and comprise over 68% of workers who grade and sort agricultural products (Gelatt, 2020). Unfortunately, these essential workers have also experienced high levels of marginalization during the pandemic in the United States. Approximately 10% of all farmworkers in the United States are workers on H-2A seasonal guest-worker visas. Additionally, the temporary final rule allows more employers to sponsor workers already in the country and will enable workers to remain past the standard three-year limit (Ong, 2020).

Human and Labor Trafficking

Agricultural migrant workers are at substantial risk of human and labor trafficking than other immigrant and migrant groups (Jenkins, 2017). Migrant farm workers are also targets of the practice of labor trafficking (Jenkins, 2017). Increased attention has been placed on the practices of human trafficking, with a particular emphasis on supply chains. Although law enforcement has paid specific attention to addressing sex trafficking concerns, labor trafficking has not received comparable attention, even though it occurs more frequently, particularly in some areas of the United States. Labor trafficking is relatively pervasive in the agricultural sector. According to the ILO, approximately 25 million people are victims of forced labor. Sixteen million victims of forced labor are in the farming, domestic work, or construction industries (ILO, 2017). The market for forced labor generates a revenue of 150 billion dollars per year. The groups most at risk for labor trafficking are indigenous peoples and migrant workers (ILO, 2016). COVID-19 also impacts migrant farm workers and the hazardous work conditions they experience further heighten their vulnerability.

Hazardous Work Conditions

Migrant farm workers are exposed to multiple risks in their workplace. An estimated two billion pounds of pesticides are used in the United States, and according to the Environmental Protection Agency (EPA), 300,000 agricultural workers are poisoned annually. These statistics may not reflect the actual estimates as many cases are not reported due to migrant farm workers' legal vulnerabilities. On-the-job deaths among Mexican agricultural workers are up to 80% more than the national average (Center for Farmworker Families, 2020). California, a temporary home for many migrant agricultural workers, continues to have exceptionally high COVID-19 rates despite strict shelter-in-place criteria. Remote education was very common from 2020 to 2022. California has the highest risk of death and injury for Mexican migrant farm workers compared to other states. Additional hazardous work conditions include laboring in the heat with no opportunity for shelter and an increased risk for heat-related injuries or the inability to take time to cool off in the shade.

Lack of Protection from the National Labor Relations Laws or Employee Rights

Farmworkers have limited labor protections in the United States and, unlike other occupations, are not protected by the National Labor Relations Laws (NLRL). This absence of legal protection results in limited oversight of industries and farms that employ them and limited support for altering poor working conditions among migrant farmworkers (Center for Farmworker Families, 2020). As a result, organizations and farms do not have to provide a minimum wage or guaranteed number of work hours. In addition, migrant farm workers are not entitled to breaks or overtime pay, which impacts their living wages. Many farms also use children as laborers. There are limited labor protections for migrant farmworkers' children (Center for Farmworker Families, 2020). Since NLRL does not protect migrant workers, they have no protection from retaliation if they engage in labor organizing. In addition, migrant farm workers are at increased health risk from COVID-19 due to a lack of access to healthcare (Fitch et al., 2017).

Increased Health Risks Due to Lack of Access to Healthcare and Testing

Fitch et al. (2017) reviewed health impacts on U.S. migrant farm workers and their families. They conducted analyses of the effects on workers in the agricultural and meat processing sectors and the associated risk factors in these industries. Fitch et al. (2017) concluded that migrant farm workers were vulnerable to increased health risks in the agribusiness sector due to low wages, poor housing conditions, and various other barriers they faced due to their status (Fitch et al., 2017; Wiltz, 2016). Other factors increasing vulnerability included: fear of losing their job or being deported and having difficulties accessing healthcare. However, the impact on migrant farm workers also threatens U.S. food security. In addition, owners of significant agricultural and related concerns depend on migrant farm workers for these jobs.

Purdue University studied agricultural workers and noted higher disparity rates and positive COVID-19 tests in minority communities (National Center for Farmworker Health Inc. [NCFHI], 2020). The study reported that over 145,000 agricultural farm workers have tested positive thus far. It is important to note that the actual figures are estimated to be much higher given the lack of access to testing and treatment. In addition, low incomes and living wages make it difficult to access healthcare (NCFHI, 2020).

Living in Substandard Housing and Dilapidated Conditions

Another vulnerability factor that migrant workers face includes living in substandard housing (Wiltz, 2016). Migrant farm workers often lack access to clean water and sanitation. Clean water and sanitation are critical for reducing COVID-19 transmission. Wiltz (2016) portrays the unsanitary conditions and housing arrangements of migrant farm workers in multiple states. Migrant farm workers often live in cramped housing with many other workers. Many of these housing arrangements are dormitory-style living with a dozen or more migrant farm workers in cramped conditions. They are not licensed, resulting in increased infectious diseases and other health risks. In addition, local or state officials lack regulation and supervision of these housing conditions (Wiltz, 2016). Inadequate living wages are linked to having limited housing options available to migrant farm workers and contribute to their cycle of poverty (Ortega et al., 2012).

The Perpetual State of Poverty

Migrant workers' incomes fall significantly below the poverty line and thus suffer all the interrelated consequences, including adverse health, nutrition, and education (Ortega et al., 2012). For example, studies have documented the impact of malnutrition on migrant farm workers' children under the age of five, resulting in stunting and significantly lower body weight compared to other children in Mexico (Ortega et al., 2012). In addition, some migrant farm workers live in state-run camps that could house up to 12,500 workers. For example, one of these California camps accounts for 1.5% of the farmworkers in the state (Center for Farmworker Families, 2020).

These frequent geographic moves negatively impact their children's education, which is linked to an intergenerational cycle of poverty. It is not unusual for migrant farmworkers' children to attend an average of four schools yearly in two countries (Center for Farmworker Families, 2020; Romano, 2010). Due to these experiences, only 10% of migrant farm workers' children graduate from high school. An estimated 400,000 children in California work with their migrant farm worker parents signaling the increased risk of child labor and lack of protection from child labor laws (Romano, 2010).

California has had particularly high rates of COVID-19 infections and deaths. Because of strict shelter-in-place criteria, most schools taught children remotely until recently. Migrant farm workers' children already faced disparities in education pre-COVID due to the need to work and lack of access to transportation and schools; however, remote teaching made education even less accessible. In addition, children who received meals at schools through special programs no longer had access to these services.

Water and Sanitation

Migrant farm workers also lack access to clean water and sanitation (both critical factors for stopping the spread of COVID-19). COVID-19 recommendations include practicing specific social isolation guidelines and hand sanitation protocols, including water and soap. WHO and the CDC recommend these practices to impede the spread of COVID-19. Migrant farm workers and billions of people worldwide lack access to adequate sanitation to practice these protocols. Migrant farm workers live in cramped housing conditions with inadequate ventilation, which increases the risk of COVID-19 (Wiltz, 2016).

Access to adequate living wages and economic opportunities is associated with the United Nations' Sustainable Development Goals. Migrant farm workers do not make a fair living wage, evidenced by their necessity to migrate from Mexico or engage in circular migration or seasonal work in search of employment opportunities. Due to inadequate living wages and access to work opportunities, many migrant farm workers are frequently separated from their families, disrupting their relationships. The lack of access to an adequate living wage impacts the ability to have safe housing, education, access to healthcare, well-being, food, transportation, clothing, and the ability to have income from savings for critical incidents such as COVID-19 (GLWC, 2020). COVID-19 has increased global recession risk, impacting an estimated 50% of the workforce worldwide. Migrant farm workers are particularly vulnerable due to their legal status, lack of labor protection, and lack of employment opportunities in Mexico. In addition to migrant farm workers, immigrant communities are disproportionately impacted by COVID-19 (Gelatt, 2020).

Immigrant Communities

The current pandemic further marginalizes the immigrant community; for instance, 38% of immigrants facing layoffs are in low-income households with income below 200% of the federal poverty line. In addition, immigrant communities are less likely to have health insurance coverage (28%), have children at home they need to care for (38%), and have limited English proficiency (55%), all further exacerbating the current public health crisis (Gelatt, 2020). In 2018, it was identified that over 7.7 million noncitizens lacked health insurance. They were disproportionately uninsured because of a lack of employer coverage and their ineligibility for public services due to their legal status (Ong, 2020). The Families First Coronavirus Relief Act passed by U.S. Congress in March, and the Health Care Enhancement Act signed into law in April 2020 authorized COVID-19 testing to be covered by Medicaid for the uninsured; however, it stipulates that only qualified immigrants, for instance, lawful permanent residents with more than 5 years in that status, refugees, or asylees would be covered (Ong, 2020).

Furthermore, the Public Charge Rule in the United States that went into effect on February 24, 2020, underscores the impact of health disparities since undocumented workers fear being able to pursue a permanent legal residency in the United States in the future if they use public benefits in the present. The Public Charge Rule allows for the denial of immigrants' applications seeking entry or legal status in the United States if they have used federal public programs to receive medical care, food, shelter, or other necessities, such as Medicaid, SNAP, or WIC benefits (USCIS, 2020). This policy further marginalizes a population that remains at the highest risk during this pandemic, creating fear based on anti-immigrant sentiment and posing a public health risk.

These financial impacts will also harm multi-generational families in the immigrant's country of origin. The World Bank reports that likely due to the effect of COVID-19, remittances to low- and middle-income countries are expected to fall 20% when compared to last year, with these regions expected to experience the most significant loss: Central Asia and Europe (23.1%), Sub-Saharan Africa (23.1%), South Asia (22.1%), and Latin America and the Caribbean (19.3%). U.S. remittances accounted for 18% of the Gross Domestic Product (GDP) in Haiti and El Salvador. In Guatemala in 2019, remittances accounted for 10% of the GDP, underscoring their importance to the national economy (Ong, 2020). Remittances in developing countries assist families with food, healthcare, and basic needs (Ong, 2020).

Indigenous migrant farm workers and their families face further consequences and barriers.

Indigenous Peoples

Indigenous peoples are another group that has been disproportionately impacted by COVID-19 (Department of Economic and Social Affairs [DESA], 2020). Indigenous peoples represent 476 different groups and comprise 6% of the global population (DESA, 2020; International Work Group for Indigenous Affairs [IWGIA], Berger, 2019). Indigenous peoples also represent 19% of the extreme poor globally. Indigenous people have multiple commonalities, consisting of various vulnerabilities and factors that marginalize them and result in health disparities and inequalities. Their shared everyday experiences include their lack of access to sufficient education, healthcare, housing, adequate economic opportunities, and employment. In addition, they are subject to discrimination and human rights abuses such as "land grabbing," making them more vulnerable to forced displacement. This forced displacement is often a result of large-scale developments and other industries which threaten their way of life and subject them to human rights abuses, including cultural extinction and violence. Other human rights violations that many indigenous peoples face include forced assimilation by their governments, military force, and lack of recognition or protection of their rights and identities as a group.

Indigenous peoples also have higher COVID-19 infection rates and mortality (Power et al., 2020). Due to the various social and health inequities indigenous peoples face, they have disproportionately higher mortality rates from communicable and non-communicable diseases, which have also been influenced by their history of colonization and invasion (Power et al., 2020). Furthermore, indigenous peoples have several intersecting identities that place them at higher risk of contracting COVID-19 and having more severe symptoms and poorer outcomes. Some intersecting factors include poverty and comorbid health conditions resulting in poorer health outcomes.

Furthermore, due to cultural reasons and history of impoverishment, many indigenous peoples live in multigenerational households and areas with no running water or community wells. Structural violence, such as a history of marginalization, segregation, discrimination toward indigenous communities, and lack of funds for services, resources, and programs, have further impacted health disparities. In addition, COVID-19 has resulted in a rise in food insecurity for indigenous peoples. It has harmed tourism, a significant income source in some indigenous communities. Indigenous peoples also had higher rates of violence pre-pandemic than all other groups, which have been exponentially exacerbated by COVID-19. This pattern has included the higher rates of violence against women and children during the lockdown.

COVID-19 has also impacted pertinent cultural practices, often a source of resilience and comfort. Furthermore, the full impact on indigenous peoples is unknown given the lack of accurate data and exclusion of them in some surveillance studies. In addition, because premorbid conditions such as Type II diabetes, rationing algorithms make it less likely that they would receive life-saving care such as mechanical ventilation (Power et al., 2020). According to the United Nations (2020) report, there is also a lack of COVID-19 testing data or disaggregation of statistics by ethnic groups, which also impacts indigenous peoples and allocation of health care funding. The lack of information sharing and delay in funding impacts resources also has contributed to conflict between agencies regarding who will pay for these resources. Pressure has been placed on national governments to disclose accurate COVID-19 rates to WHO (UN, 2020).

Other pertinent impacts of COVID-19 on indigenous peoples include their collective trauma being retriggered as a group. As mentioned earlier, indigenous peoples are three times more likely than the national/global average to be impoverished, which places them at many other risks. They lack access to quality and culturally appropriate health services (UN, 2020). In addition, a lack of access to clean drinking water, sanitation, public services, and adequate nutrition impacts their ability to practice guidelines to stymie the spread of COVID-19, with a deleterious impact on their health and vulnerability to develop more health issues. Due to a lack of recognition of their identity (varies per country) and their invisibility as a group, culturally sensitive health and social services are often unavailable. Indigenous peoples also do not have access to prevention and health services in indigenous languages, which further impacts their vulnerability and risk factors (UN, 2020). COVID-19 also affects indigenous peoples of all ages due to limited technology and the lack of options to work or go to school remotely.

Recommendations for Working with Indigenous Communities

The UN report (2020) makes multiple recommendations to reduce the adverse health impact on indigenous peoples and their communities by including them in participating in plans that would benefit them. Some ways to encourage active and meaningful participation include connecting with indigenous institutions and partnering with them to have a more accurate method to identify their needs, including the impact on invisible and vulnerable groups (elders, women, children, adolescents, and groups with disabilities). It is pertinent to include indigenous views that reflect their needs to develop programs and efforts to provide meaningful aid. More efforts should be made to increase dialogues between indigenous peoples and health and science experts on relevant topics to their community (isolation, testing, access to information, healthcare, and services). Increased efforts must be made to have meaningful dialogues with representatives of indigenous communities and participation between state and indigenous institutions on ways to mitigate COVID-19.

Indigenous peoples should also be included on emergency response committees and during all phases of a crisis (before, during, and after). In addition, indigenous peoples must have access to prevention information that is culturally appropriate and in their language that addresses the needs of vulnerable subgroups in their community, such as those that have disabilities. Plans should be developed to provide prominent needs for indigenous communities, such as access to nutritious food, safe drinking water, and sanitation. In addition, these plans should identify indigenous women's needs and promote their rights in multiple areas and sectors (informal sector, caregivers, providing social protection through prevention, and response services). Another group that should be targeted is indigenous youth in need of mental health and psychosocial support services.

Another area that adversely impacts indigenous peoples includes increasing access to remote learning due to limited technology and resources in indigenous communities, particularly for children and youth. There also needs to be an increase in strengthening and buttressing indigenous peoples' livelihoods and local economies when considering relief and recovery efforts. Media highlighting culturally appropriate COVID-19 content is another way to increase education and prevention information. Power and colleagues (2020) also discuss the need to include cultural determinants of health in policies, practice, and research when developing programs for indigenous communities.

Persons with Chronic and Severe Mental Illness and Homelessness

Often-overlooked marginalized communities are individuals with chronic/severe mental illness (SMI) and those who are homeless (Lima et al., 2020). The authors note that over one billion people live in slum-like conditions and comprise 30% of the world's population that live in urban areas; of these, over half a million people in the United States are homeless. Many homeless people live at bus stations, train stations, encampments, on the sidewalks, and/or visit hospital emergency rooms, all spaces that place them at higher risk of contracting COVID-19. Shelter crowding as a transmission factor is suggested by the finding that people experiencing unsheltered homelessness have a lower risk of COVID-19 than those staying in shelters (Baggett & Gaeta, 2021).

Persons who are homeless have lower life expectancy rates and comorbid mental health and health diagnoses that put them at greater risk of developing COVID-19 and experiencing greater COVID-related mortality than the general population. For example, among UK homeless populations, the average lifespan is 45 years for men and 43 years for women (Lenhard et al., 2022). This group's widespread health problems included tuberculosis, hepatitis C, and cardiac issues (Lenhard et al., 2022) as well as a higher overall mortality rate than the general population. Residing in areas such as outdoor encampments and shelters, make it more challenging to practice social distancing methods and reduce access to routine hygienic practices such as clean water and sanitation. Persons who are homeless also lack access to adequate healthcare and transportation, making them more prone to developing chronic health conditions or taking medications inconsistently. Some individuals with severe mental illness also use substances to cope with their symptoms. Those with chronic mental illness such as schizophrenia also are impoverished, frequently physically and/or cognitively challenged and have limited social support and coping skills. In addition, they lack access to personal protective equipment such as masks that would further protect them from contracting or transmitting the virus (Lima et al., 2020).

This writer (FR) worked in several settings (residential settings, detention centers, and a community outpatient program) during COVID-19 with individuals with SMI and a history of homelessness in residential and community outpatient programs. During COVID-19, the long-term and restrictive lockdown procedures made it difficult for homeless individuals with SMI to access services that would assist them (library, activities, movie theaters, recovery cafes, senior centers, etc.). Within the homeless demographic, individuals that are older adults with severe mental illness are increasingly at risk of contracting COVID-19. In addition, their lack of access to technology and literacy made it difficult for individuals with SMI to participate actively and meaningfully in telehealth services or telepsychiatry visits, which further worsened their mental health. Restrictive lockdown procedures on public transportation and public facilities providing housing also made it difficult to conduct routine mental health visits for individuals with SMI. These settings included skilled nursing facilities and lockdown shelters.

Homeless Individuals with Mental Illness in India

Internationally, homeless individuals faced multiple challenges—particularly in accessing social support and health services (Gowda et al., 2020; Martin et al., 2021; Roncero et al., 2020). Homeless individuals with mental illness were adversely impacted by the strict lockdown measures imposed in India (Gowda et al., 2020). India has stark gaps between the different socioeconomic groups, and access to services is problematic. These issues became even more pronounced during the COVID-19 pandemic. India has a significant shortage of mental health providers to care for those with severe mental illness (SMI) compared to other countries. India has fluctuated with the number of COVID-19 infections documented but remains in the top three countries, along with Brazil and the United States. India has also not had adequate COVID-19 testing, so reported statistics were likely underestimated. On March 21, 2020, Prime Minister Modi initially implemented a lockdown in the state of Rajasthan. The lockdown throughout India was imposed shortly after on March 25, 2020. However, although WHO initially praised Modi's efforts, these actions had detrimental consequences on migrant workers stranded without economic/food resources and forced to walk 100 km to meet the curfew and lockdown protocol imposed upon them without warning.

The National Mental Health Survey conducted in India in 2011 estimated that there were approximately 1.77 million homeless people in India. Of these, about 1% were judged to have a mental illness (Gowda et al., 2020). In India, homeless individuals often reside at train and bus stations, on the streets, and at beggars' homes. These figures are current estimates and may reflect the political influence on the availability and provision of social security safety net services, the wide gaps between socioeconomic, ethnic, and religious groups, government treatment of indigenous peoples, and the rural and urban divide.

As in other parts of the world, homeless individuals with mental illness in India are more susceptible to being at risk for COVID-19 and are highly marginalized and stigmatized (Gowda et al., 2020). Multiple risk factors include lack of self-care, access to sanitation, comorbid health and mental health conditions, inability to practice social distancing suggestions due to living in crowded areas, and lack of education and information about COVID-19. In addition, the lack of access to adequate healthcare and food insecurity among those with SMI also increased the risk of developing COVID-19. However, some government agencies, such as the Delhi Urban Shelter Improvement Board and the Centre for Urban and Rural Development Authority, developed an action plan to meet the needs of homeless individuals with mental illnesses. These plans included the provision of community toilets that are functional and hygienic, drinkable water, resources for sanitation, cleaning requirements for facilities, providing adequate supplies for sleeping, and three meals a day. However, data on how the homeless and migrant population benefited from these resources throughout India are unavailable.

In the Indian state of Karnataka, a comprehensive COVID-related plan was implemented. Persons who were homeless screened for mental illness, substance abuse issues, and potential for withdrawal from substances (Gowda et al., 2020). Additional COVID-19 recommendations were made for individuals with a history of mental illness and substance abuse, including having separate COVID-19 protocols in place as potential withdrawal from substances could falsely mimic COVID-19 symptoms.

Homeless Individuals with Mental Illness and Substance Abuse in Spain

Martin et al. (2021) discuss the impact of COVID-19 on homeless individuals in Spain. Based on this information, they implemented a program that included ongoing visits while living in a hostel that provided treatment and monitored symptoms of mental disorders and substance abuse. It is conservatively estimated that, in Spain, there are approximately 25,000–30,000 persons who are homeless. Martin et al. (2021) note that 63% of these homeless individuals had mental illness/substance abuse issues or a combination of both requiring psychiatric services and medications (Martin et al., 2021). Approximately 50% had dual diagnoses (mental illness and substance abuse), about one-third (37%) of these individuals used follow-up resources with the psychiatric service's Mental Health and Addiction Network. The success of this program included a substantial reduction of homeless individuals and those with mental illness utilizing hospital emergency services and an overall reduction of COVID-19 infections in this group (Martin et al., 2021). Additionally, individual treatment plans were implemented for those participating in the study, which included assisting them and increasing community social support for successful reintegration.

Ralli et al. (2020) studied the intersectional identities of homeless individuals and migrant workers living in hazardous housing conditions during COVID-19. Homeless people and migrant workers risk contracting COVID-19 due to precarious and unsafe housing conditions. Some risk factors described through other studies include the inability to practice recommended protocols to mitigate COVID-19 infection, including crowded housing conditions, inability to socially distance, increased instances of mental and physical health comorbidities compared to the national average, and limited access to appropriate healthcare resources and treatment. These factors will likely result in advanced cases of untreated COVID-19 infections among these marginalized communities.

Access to Healthcare Among Marginalized Groups and Communities of Color

Before the pandemic, the *Tracking Universal Health Coverage: 2017 Global Monitoring Report* indicated that at least half the world's population did not have access to essential healthcare due to cost (WHO, 2017a, b). The report also stated that there are wide gaps in healthcare. Affordable healthcare is a challenge for affluent regions in Eastern Asia, Latin America, and Europe, with accessibility gaps most visible in Sub-Saharan Africa and Southern Asia (2017). A 2020 national health statistics report in the United States revealed that 31.6 million people of all ages were uninsured during the survey (Cha & Cohen, 2022).

Those with most difficulty accessing care are marginalized groups, from Black, Indigenous, and People of Color (BIPOC) communities. Populations become marginalized if they are excluded from mainstream social, economic, or cultural life (Sevelius et al., 2020). Some examples of marginalized and excluded communities include populations excluded due to race, social class, gender identity, sexual orientation, sex, age, physical ability, language, immigration status, and income level, to name a few (Sevelius et al., 2020).

Upali (2015) indicates that marginalized groups are formed as social, economic, cultural, and political factors in a hierarchical society contribute to the exclusion of community members. These exclusionary societies can exist in other places in time, space, and geography (Upali, 2015). Members of marginalized groups can be included in more than one category. For example, an indigenous person could also be excluded from society due to age or sexual orientation. Being a part of more than one marginalized group at a time increases the chances of exclusion. However, belonging to a marginalized group does not mean one remains marginalized across all spaces of time, locations, or situations as an individual's circumstances and access to mainstream social, economic, and cultural life are continuously changing.

As an individual's circumstances and access shift, their identification with a marginalized group shifts (Upali, 2015). Therefore, being a member of a marginalized group is situational.

In marginalization, there is a physical distance between resources in contrast to those with greater access to resources. Currently, persons in marginalized groups have the highest risk for poor health outcomes as exclusion from mainstream society leaves individuals vulnerable to social, economic, physical, psychological, and physiological deterioration (Baah et al., 2019). A report on unfair healthcare treatment in the United States found that African-Americans and Hispanics tend to receive lower quality healthcare. African-Americans receive more undesirable therapies, such as amputation, than European-Americans, and these disparities exist across clinical settings and diseases (Institute of Medicine, 2003). In addition, some evidence shows that implicit bias from physicians influences African-Americans' reactions to medical treatments and health outcomes (Penner et al., 2014).

Recent studies in Canada and the United States have also affirmed evidence showing the inequality in the healthcare experience in other populations. For example, Canadian research on the homeless population concluded that this population experiences the consequences of stigma and shame while accessing healthcare services and that the services provided did not adequately meet professional standards of accessibility, universality, and patient-centeredness (Purkey & MacKenzie, 2019). Similarly, a study published in the United States found that transgender youth of color experience similar stigma across multiple healthcare settings (Goldenberg et al., 2021). In addition, WHO reported significant limitations in the accessibility and delivery of proper healthcare to European refugee populations (WHO, 2018). Discrimination in healthcare treatment due to language difficulties was also reported in this population (Gil-Salmerón et al., 2021). These examples demonstrate clear obstacles to accessing healthcare for marginalized groups. Differential healthcare treatment for marginalized people has the potential to solidify societal power imbalances while also creating a false narrative that healthcare is not a human right for all, where all populations have equality in healthcare services.

As addressed previously in the chapter, healthcare facility access and access to healthcare workers is a problem for populations in rural areas and areas that service low-middle income level communities, often affecting marginalized groups. However, low-resource facilities also pose a problem for marginalized groups. Low-resource facilities are healthcare settings with poor environmental and operating conditions and limited technology (Piaggio et al., 2021). According to WHO (2020), one in four healthcare facilities worldwide has no access to water services putting 1.8 million people at risk for developing or continued illness. These facilities most likely represent low-middle income countries where 50% of healthcare facilities lack piped water, 39% lack handwashing essentials, and 59% lack reliable energy services (Cronk & Bartram, 2018).

Low-resource facilities also lack essential medical devices, specialized doctors, and technicians to repair and operate medical devices and sufficient funding (Piaggio et al., 2021). Telehealth has the potential to improve access to healthcare for the most vulnerable populations; however, financial barriers and poor infrastructure conditions have stifled some of this potential. Although there was an appreciable increase in telehealth services during the pandemic, overall, the increased use telehealth services has been slow (Smith et al., 2020). Even in rural areas of industrialized countries, like the United States, fewer than 1% used telehealth (2020).

Conclusion

COVID-19 has disproportionately impacted marginalized segments of the world's population. A minority often neglected in these discussions is the large number of migratory workers. This population, already at risk for adverse health outcomes because of lack of access to healthcare, poor living conditions, and poverty, may include individuals who are COVID-19 carriers. Due to the lack of access to antibody testing, these workers are likely to transmit the virus to fellow workers because of the inability to engage in social distancing in their living environment. With migration increasingly common worldwide, international efforts are required to organize and provide healthcare to this transient population.

In conclusion, multiple factors impact COVID-19 infection rates. It is pertinent to explore the healthcare disparities and inequities of vulnerable and marginalized groups such as BIPOC communities, indigenous peoples, immigrant communities, refugees, asylum seekers, migrant workers, detained and incarcerated individuals, and those with a history of chronic mental illness and homelessness. When analyzing healthcare disparities, it is incumbent to focus on the role of social determinants of health and structural violence and how they contribute to the rising COVID-19 infection rates in the United States and other countries and develop a plan to mitigate these disparities.

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Chapter 7
COVID-19: Ethical Dilemmas

H. Russell Searight

The God Committee

While Walter Kolff, a Dutch physician, originally developed kidney dialysis, his procedure for connecting the patient to the dialysis machine presented a challenge for regular use since each artery and vein could only be used once. At Seattle's Swedish Hospital, physician Belding Scribner developed an in-dwelling shunt that could be used indefinitely. The first in the United States, the Swedish Hospital's dialysis unit soon followed. However, the team only had a few machines for long-term dialysis (Jonsen, 2007). At that time, patients diagnosed with renal failure had a limited lifespan. When Swedish Hospital's dialysis unit became known, many more patients sought dialysis than could be treated. Essentially, life-or-death stakes involved two questions: "Who among the various applicants was most deserving of dialysis?" and "Who will we allow to live and who will die?"

To decide who should receive dialysis, the hospital formed a committee. The members were charged with making a decision that would determine who would have a longer life and who would die relatively soon. This decision was not going to be based on medical grounds. Named the "God Committee," by an article in the popular magazine, *Look*, the members would determine and evaluate the "worth" and "deservingness" of each dialysis applicant. While the committee included one physician (a surgeon) the other members did not have a medical background—a minister, "housewife," banker, state government official, labor leader, and lawyer. After establishing that children and anyone over age 45 were not candidates, the committee developed a list of the dimensions to make decisions. In addition to age, sex, marital status, number of dependents, income, net worth, emotional stability,

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educational background, occupation, and “future potential” were considered as relevant dimensions. The committee also accepted outside information in the form of letters of recommendation on behalf of specific patients. The discussion of social worth and the perspectives taken by members with varying backgrounds led to some intriguing exchanges:

Surgeon: How do the rest of you feel about Number Three—the small businessman with three children? I am impressed that his doctor took special pains to mention that this man is active in church work; this is an indication to me of character and moral strength.
Lawyer: It would also help him endure a lingering death…
Minister: Perhaps one man is more active in church work than another because he belongs to a more vibrant church.
Labor Leader: For the children’s sake, we’ve got to reckon with the surviving parent’s opportunity to remarry. A woman with three children has a better chance to find a new husband than a very young widow with six children (Levine, 2009, p. 1).

In the United States, explicit rationing of healthcare resources is rare, except for organ transplantation. However, during COVID-19, criteria were developed by many hospitals to determine which patients would and would not receive intensive care unit treatment as well as artificial ventilation. Because of time urgency and other factors, deliberations were not as extensive as those of the Seattle “God Committee.” However, deciding which patients would receive limited resources became a significant moral dilemma.

Overview of Ethical Models in Health Care

Ethical issues came to the forefront with COVID-19 from the pandemic’s beginning. Moral questions around the restriction of individual liberties through social distancing and lockdowns and even requirements for mask-wearing immediately raised conflicts—particularly in countries with cultural norms valuing individualism over collectivism. Other more difficult issues arose as the number of severe cases escalated. Rationing intensive care unit beds and ventilators became necessary. Specific algorithms were developed for decision-making in these dilemmas. However, issues of social worth, like those that confronted the “God Committee,” crept into decision-making. Dimensions such as the patient’s age and health status were included in determining who would receive more aggressive care.

However, before examining the moral dilemmas that arose during the pandemic, it is helpful to understand the philosophical theories employed in biomedicine and public health. While not exhaustive, a brief overview of deontology, utilitarianism, principlism, virtue ethics, libertarianism, and communitarianism follows. These models of moral decision-making often explicitly or implicitly guided moral choices arising during the pandemic.

Deontology

Associated with the philosopher Immanuel Kant (1724–1804), deontology emphasizes Duty—our behavior toward others is rooted in our obligations. There are a priori standards for a profession. These standards do not change with the circumstances of a human dilemma. An essential Kantian concept is that of the categorical imperative–moral absolutes that exist apart from the social context and laws. Principled actions are inherently good apart from their consequences. While there may be situations in which some would say telling a "white lie" to preserve someone's feelings, is permissible and even desirable, deontologists argue that lying alone is immoral despite the good that may come from it. Instead of the ends justifying the means, the Kantian worldview holds that the context-based motivation for an act is irrelevant. Certain acts are unacceptable--regardless of the circumstances.

Kantians also believe that people have inherent worth and that humans should never serve as a means to an end. This principle is raised when a patient suffering "brain death" is viewed as a source of organs that would benefit other patients.

Garbutt and Davies (2011), in their analysis of Britain's National Health Service, note that the General Medical Council's standards for practice begin with this dictum: "You must take care of the patient [as] your first concern" (p. 1). By implication, economics and limited health care resources should not interfere with this duty. Furthermore, Kantian moral absolutes are present in virtue-based models such as the Hippocratic Oath (e.g., "Into whatever home I go, I will enter them for the benefit of the sick, avoiding any voluntary act of impropriety or corruption"). Britain's National Health Service, which includes an ongoing tension between cost and patient care, illustrates how deontology can conflict with consequentialist or utilitarian values.

Utilitarianism

Based upon the work of Jeremy Bentham (1748–1832) and John Stuart Mill (1806–1873), utilitarianism prioritizes the outcome or consequences of actions rather than the acts themselves. Utilitarianism holds that the correct moral choice is the one that provides the greatest good for the greatest number of people. When there is a conflict between society and individual patient well-being, the utilitarian perspective typically holds that the community's well-being takes precedence. While Kantian ethics argues that specific actions are inherently moral, utilitarian ethics is considered consequentialist and outcome-focused rather than principle-focused.

While generally considered a moral philosophy governing health at the social or community level, utilitarianism has been applied to ethical dilemmas involving individual patients. A Kantian categorical imperative would be that lying to a patient is unacceptable. However, recent discussions in dementia care include the practice of therapeutic lying—justified by utilitarian reasoning. Research suggests that some residential care staff engage in therapeutic dishonesty to prevent emotional distress or aggression from older residents with neurocognitive impairment. For example, one staff member provided the following example: “there is one particular woman (resident) here who wants to run away all the time. You settle her down by telling her that the trains are on strike” (Tuckett, 2012, p. 6). Another example that may be more morally troubling to a Kantian is: “the wife was in a severe car accident and the husband… (Our resident)… We weren’t allowed to tell them what happened to his wife. The resident has dementia… I told him his wife is having a rest and shall be up later in the day and she’s just phoned and she’s running late… This had calmed him down and eased his mind that his wife hasn’t left him or doesn’t love him anymore” (p. 8).

As noted above, even for physicians affiliated with a system rationing care before the pandemic, providing patient-centered care while following Britain’s National Health Service (NHS) guidelines generated moral dilemmas (Jeffrey, 2020). With the NHS as an example, utilitarians would assert that the maintenance of the system itself is a high priority. However, if resources are not used judiciously within the stewardship framework, Britain’s government-provided health care system is at risk. Periodically, new strategies for preventing insolvency are attempted. For example, since hospital-based care is significantly more expensive than outpatient clinical care, utilitarian logic would discourage inpatient admissions. Garbutt and Davies (2011) provide the short-lived, fiscally driven NHS innovation of paying general practitioners bonuses for not referring patients to the hospital. As noted above, a patient’s age has been a criterion in some countries for determining the level of care for COVID-19. The NHS has, for some time, used age for determining some therapies. The NHS website for patients who are candidates for dialysis indicates that someone who is in their 20s when they begin dialysis can expect to live 20 more years; however, for those over 75 who start dialysis, the site indicates that their life may be prolonged for only 2–3 years.

Garbutt and Davies (2011) note that deontological principles centering on a clinician’s duty to patients may conflict with the fiscal and policy objectives of the NHS itself. They note that the physician-centered General Medical Councils’ standards emphasize the physician’s responsibility while providing minimal guidance when the unavailability of resources prevents the physician from carrying out their duty to the patient.

Threats to the survival of the NHS were one factor leading to the establishment of the National Institute for Clinical Excellence (NICE). A significant dimension NICE uses in developing clinical recommendations is the consequence of various treatments. Utilitarianism accepts that healthcare resources are inherently limited and that some sort of system, such as rationing, will be necessary to achieve maximal benefit to society. The combination of consequences—in the form of clinical outcome and cost—guides utilitarianism. While not typically advertised by utilitarian adherents, some fatalities are accepted if the process benefits the public good. For example, some vaccines have a very low probability of causing illness or may lead to death in very few extreme cases. Since the vaccines save many lives, from a utilitarian perspective, these highly infrequent deaths are morally acceptable.

In health care, utilitarian values have been quantified as Quality Adjusted Life Years (QALYs). This index is used by NICE and the Canadian Agency for Drugs and Technologies in Health (Vaillancourt, 2020). QALYS are reported in years and reflect the overall health of specific individuals. So, for example, gaining one extra year of life while suffering from severe Chronic Obstructive Pulmonary Disease (COPD) is worth less than one additional year without health-related limitations (Vaillancourt, 2020). However, the QALYs approach can lead to morally disturbing conclusions. For intensive care units, during the pandemic, older adults and those with comorbid medical conditions were more likely to have fewer QALYs. This result occurs because even if these more senior, sicker patients survived, they would have a briefer lifespan compounded by chronic health problems such as Type II diabetes. In some instances, this constellation of factors would lead to palliative care only.

When applied on a population level to people living through the COVID-19 pandemic, utilitarians would also include other costs—increased rates of domestic violence or limited educational progress among children and adolescents. However, factors associated with the pandemic possibly prolonging life are reduced traffic-related injuries and deaths and fewer severe asthma episodes due to reduced air pollution. During the pandemic, non-COVID illnesses were de-prioritized in terms of treatment. Gheorghe et al. (2021) quantified the number of QALYs lost, due to COVID-related delays in cancer treatment. In England, it was estimated that there would be 3620 avoidable cancer deaths equating to 32,700 QALYs, which the investigators indicate is likely to be a significant underestimate.

Principlism

Principlism is the most commonly taught and applied medical ethics model in the United States and in much of the Global North. In developing this model, Beauchamp and Childress (2009) examined existing philosophical approaches to ethical dilemmas in medicine and distilled them into four fundamental principles: autonomy, beneficence, nonmaleficence, and justice. Principlism, sometimes referred to as "the four principles," is primarily applied to individual clinical cases, although public health has recently combined principlism with utilitarianism (Vearrier & Henderson, 2021). The first three dimensions are most relevant in clinical situations; the fourth dimension, justice, is usually the principle that is minimized in most patient-centered analyses. In addition, however, justice is relevant to issues such as fairness in allocating treatment.

Autonomy includes the concept of personal independence and self-determination—the ability to exert control over essential decisions impacting one's life. Autonomy also "umbrellas" the concept of informed consent. One cannot make truly autonomous decisions without adequate knowledge. Patient autonomy is violated or compromised when individuals have not been given all relevant information about a medical decision or are unable to cognitively retain and assimilate information and apply it to their current health circumstances. Examples of the emphasis on patient autonomy include passing legislation in multiple U.S. states and other countries allowing premature physician-assisted death upon patient request. In addition, developing advanced planning documents allows one's wishes to be expressed when the patient can no longer do so.

Nonmaleficence is best summed up with the mandate "do not harm." Beneficence has been interpreted as the duty to treat patients only with interventions with a reasonable likelihood of benefit.

A significant criticism of Beauchamp and Childress' presentation of principlism is that the four principles have equal weight and have no priority. This issue becomes a problem in clinical situations in which the principles conflict with one another. When those conflicts arise, there is no logical system to resolve these contradictions. For example, concerning issues such as COVID-19 vaccine allocation or decision-making about which patient should receive ventilator support when the number of ventilators is limited, the principles of justice, nonmaleficence, and beneficence have conflicted.

Furthermore, many commentators have indicated that the four principles are, in reality, not equally weighted in decision-making and that patient autonomy is "first among equals" (Gillon, 2003). While Beauchamp and Childress (2009), the major proponents of principlism, assert equality among the principles, a perusal of legal rulings and cases addressed by hospital ethics committees finds that patient autonomy is a common nexus of conflict. In the Global North, autonomy is equated with patient choice, self-determination, and non-interference (Saad, 2018). It has been argued that autonomy has moved away from the well-being of someone who is ill to a requirement that patients have a wide array of treatment options to consider. Saad (2018) also argues that, as a result, beneficence and nonmaleficence have been pushed to the side. The emphasis on autonomy has elicited considerable social discord during COVID-19. The government regulations requiring mask wearing, social distancing, and vaccine passports have been seen as intrusions upon individual self-determination. This assumption of equality among the principles also becomes questionable in recent bioethical cases, such as patients with psychiatric conditions and no life-threatening illness requesting physician-assisted death (Evenblij et al., 2019).

The weakness of principlism, the absence of a system to resolve differences between competing principles, is also one of its assets. This flexibility allows these four principles to readily adapt to morally based medical dilemmas arising internationally and cross-culturally (Gillon, 2003).

Virtue Ethics

Bellazzi and Boyneburgk (2020) define virtue as a "…disposition that enables us to perceive, feel, want and act in certain ways" (p. 4). Virtue ethics, exemplified by the Hippocratic Oath and more recently by Thomasma and Pellegrino, shares some similarities with deontology in that it focuses on enduring internalized guidelines. As in the Hippocratic Oath, the physician's moral character is the vehicle for ethical conduct. In contemporary medicine, the Oath has often been reduced to "first do no harm," even though Hippocrates did not write this famous phrase as part of the Oath. Hippocrates did indicate that a virtuous physician in treating patients would "…do not harm or injustice to them…." Concerning assisting in an expedited death at the end of life, the Hippocratic Oath states, "I will not give a deadly drug to anyone if I am asked nor will I advise such a plan…."

In a perspective given increasing attention in U.S. medical education, Thomasma and Pellegrino (Thomasma, 1990) describe the characteristics of a morally good health care provider. These qualities include competence, compassion, fidelity, prudence, integrity, respect, and self-effacement. In addition, the physician's fiduciary duty (fidelity) to the patient is an overarching principle. While patient autonomy is recognized, health care professionals have a moral responsibility to be prudent—to offer treatments that are established as effective. Finally, a "meta" virtue is phronesis—a type of wisdom. Phronesis sits at the nexus between the physician's formal knowledge and scientific knowledge, as well as between the provider's clinical expertise and 1:1 interaction with the patient (Hoffmann, 2002).

Justice as Fairness

The philosopher, John Rawls, provided what some might call a "limited domain" ethical theory. Rawls focuses specifically on distributive justice. His model was given considerable attention during the pandemic. Rawls' theory was applied to rationing, limited health care resources, and demographic groups that might be prioritized for receiving the vaccine. His veil of ignorance is a philosophical thought experiment in which the audience is asked to imagine a situation in which a society with formal rules, laws, and expectations has not yet developed. None of those in the community have yet to be in an established social position or status. Rawls called this the original position. However, there are a limited number of goods, but to ensure fairness, these goods are distributed by someone behind "a veil of ignorance." Because of the veil, these goods would be distributed without knowledge of the recipients' characteristics. With the veil of ignorance as a basis, everyone is guaranteed a certain level of rights and liberties and is considered equal. Additionally, everyone will be receive an equal distribution of educational and employment opportunities so all can have "the same basis for competing for subsequent positions." At this point, Rawls' theory would suggest that for rationing ventilators in a hospital, a lottery, or first come, first served standard would be appropriate (White & Lo, 2021).

From the perspective of justice universal healthcare and guaranteed annual income, everyone is guaranteed a baseline level of goods and services to pursue their specific values of a "good life" and maintain dignity and self-respect. When it comes to inequalities, however, in a Rawlsian analysis, they are permissible only when a decision would benefit those who are the least advantaged (Rawls, 2001). Those with the least must be better off than they would in any alternative system of distribution of goods and services (Goldberg, 2017). However, Rawls disagrees that following these guidelines would eliminate inequality (Goldberg, 2017). Rawls emphasizes the ability to pursue interests or opportunities rather than a quota of income, goods, services, and education. While Rawls' "ideal" society has never been achieved, the closest approximation would be the Scandinavian societies in the 1970s. All are guaranteed quality education and income support, so those unemployed or unable to work can live comfortably, and good quality housing is available. These countries are all social democracies. They have very high taxes, with the wealthy bearing a disproportionate burden of taxation. While inequalities and income disparities remain, these differences are not as extreme as those in the United States.

Ethical Theory Applied to COVID-19's Moral Dilemmas

Ethics in public health have not received nearly as much attention as ethical models dealing with clinical dilemmas. The deontological duty of health care providers, their virtue of fidelity to patients, and the value of promoting autonomy within the context of beneficence and nonmaleficence cause substantial cognitive and emotional dissonance when patients' care is restricted so that other patients who are more deserving of treatment can receive it. The psychological distress associated with these morally charged decisions is likely a factor contributing to the high prevalence of significant psychiatric symptoms among up to 50% of health care workers during the COVID pandemic (Young et al., 2021).

Among ethicists, health care policymakers, and providers, explicit guidelines denying care to specific patients (White & Lo, 2021) have raised considerable controversy. Particularly in countries such as the United States, where patient autonomy is highly valued, patients must give informed consent to any limitations on their treatment. In terms of end-of-life care, patients have been able to receive treatments that have a low probability of success and that some would consider futile. As evident from the ethical models, COVID-19 presents significant moral dilemmas centering around a long tradition of individually focused patient-centered healthcare conflicting with crisis-centered utilitarianism. In addition, in countries such as the United States, with the strong emphasis on autonomy and individual rights, historically, the degree of social solidarity that would enable ready acceptance and enactment of policies that temporarily reduce individual liberties such as stay-at-home orders, masking, social distancing, and proof of vaccination requirements has not been present.

The preeminent ethical model for public health is utilitarianism. By definition, utilitarianism addresses collective well-being rather than individual health. Utilitarianism accepts that some lives may be lost, which is acceptable if more lives are saved. Ethical decisions guided by utilitarian Ethics are more likely to be situational. For example, in protocols for rationing ventilators for COVID patients, one of the guidelines is to continue to re-evaluate whether a patient is benefiting from ventilation and whether or not there are patients who might benefit more (Rosenbaum, 2020).

Health care professionals have ethical codes that are deontological in nature. They specify the duties and moral responsibilities that should be followed—typically with little exception. The fiduciary responsibility of patients is not altered by situational factors such as limited resources. The ethical principle of patient autonomy is also a moral absolute. Indeed, variations on virtue ethics, such as those of Pellegrino and Thomasma, emphasize that the physician's role is to maximize patient autonomy (Pellegrino, 1994).

COVID-19 and Hybrid Ethics

The COVID -19 pandemic has brought together clinicians and public health officials guided by distinct ethical principles. The pandemic has challenged ethicists and practitioners to find a middle ground. Vearrier and Henderson (2021) describe combining Beauchamp and Childress' four principles with utilitarianism. Verrier and Henderson (2021) describe utilitarian principlism as a framework in which "… autonomy transitions from individualistic to relational, nonmaleficence tolerates a 'learn as we go mentality,' beneficence seeks population health and justice takes on a more important role …" (p. 46). They note that some policies and practices adopted during COVID-19 could be framed as acts of beneficence. For example, working longer hours, allowing providers to care for patients outside their typical scope of practice, being quickly retrained in the knowledge and skills required to provide care to COVID patients, and being permitted to practice across state lines in the United States. All of these changes, while consistent with public health's crisis utilitarianism, are also consistent with health care providers' value of beneficence (Vearrier & Henderson, 2021).

In the United States, the emphasis on patient autonomy coincides with a consumer orientation in seeking health care. These values are exemplified in end-of-life care, where patients or their designee's request to provide active treatment has historically been honored even when it is unlikely to be successful (Searight, 2019). During public health crises such as COVID-19, placing some parameters around this unbridled autonomy is appropriate (Vearrier & Henderson, 2021), as is the case in the United Kingdom (Dzeng et al., 2015). Similarly, over the past several decades, patients have requested specific medications they have seen online or in other media. During COVID-19, this consumer orientation has led patients to request prescriptions for ineffective and possibly harmful drugs such as hydroxychloroquine sulfate.

Autonomy, in its extreme version of a self-contained individual acting for their well-being without constraint, is unrealistic and questionably moral. The boundaries of individual independence occur when personal freedom infringes on another's ability to be self-determined (Jeffrey, 2020). To optimize unique well-being during the pandemic, relational autonomy is necessary and involves a change from a focus on "the individual self to one embedded in a social context" (Jeffrey, 2020, p. 496). In the context of the COVID-19 pandemic, this relational self values social solidarity—a shared purpose. In the case of COVID-19, this collective purpose is to enhance the population's overall survival (Jeffrey, 2020). National leaders often emphasize the principle of "We are all in this together." Often, a country's history is invoked to elicit unity. Queen Elizabeth's televised address about COVID-19 opened with an acknowledgment of the disruptions and deaths the pandemic had caused. She then praised essential frontline workers carrying out their duties "in support of us all…" In addition, Queen Elizabeth mentioned the sacrifice of World War II when children were sent to the countryside from London, reminding British citizens that they had overcome adversity in the past through their collective efforts. She then thanked those who were remaining in their homes "to protect the vulnerable." With social solidarity as a moral value, there is an agreed-upon commitment to assist the most vulnerable members of society (Jeffrey, 2020). As in Queen Elisabeth's COVID-19 speech, restrictions such as quarantine, lockdowns, mask-wearing, and social distancing, while consistent with utilitarianism, have, in the context of solidary, been framed as voluntary, altruistic acts (Hayry, 2022) directed to a common enemy. The Vietnamese government effectively generated solidary by characterizing COVID-19 as a war. Precautionary measures such as social distancing and obeying stay-at-home orders were acts of patriotism. A popular poster conveyed, "to stay home is to love your country" (Le, 2020; cited in Ivic, 2020).

However, the principle of reciprocity is related to, yet distinct from, utilitarianism. In keeping with social solidarity in the context of relational autonomy, when regulations diminish freedom, there is a corresponding responsibility to offer support for the sacrifice of complying with restrictions to benefit the social good. When additional burdens are placed on individuals, the principle of reciprocity should be activated (Gozum et al., 2021).

During Wuhan, China's, extended lockdown, mutual aid societies of volunteers assisted with providing food, helping migrant workers with housing, and delivering supplies. These actions were through an informal network—generally communicating through social media (Ni et al., 2020). Some of these aid societies were established by citizens during the pandemic—the aid societies filled in the gaps left by the government's efforts. A study in Japan found that higher levels of reciprocity and trust in the government were associated with fewer COVID deaths (Murayama et al., 2021).

The author (HRS), a university professor, observed several examples of policies reflecting reciprocity. At the university where I teach, when students were sent home from the university in early March 2020, all classes switched abruptly to an online distance format. Many classes were recorded so students could watch them on their schedule. Students were also allowed to take all their classes pass-fail rather than requiring a letter grade. Another example was that local bars were able to serve drinks for carry-out, and some even delivered. National governments also followed the principle of reciprocity with monetary grants. Monetary grants from the governments of Japan, Germany, Britain, and the United States provided direct support to individuals as well as small businesses. In some countries, government funds were associated with a contingency. For example, in the Czech Republic, small business owners who had children not attending school because of the pandemic could receive a stipend from a specific government fund (Akbulaev et al., 2020).

In the following sections, specific moral dilemmas raised by COVID-19 will be examined from the perspective of various ethical theories.

Rationing Care During COVID-19: Guidelines

For many healthcare providers, the most distressing moral conflicts arose from the need to ration treatments that would permit some patients to survive, leaving others to die from COVID-related illness.

The Rationing Algorithm

The rapid increase in acutely ill COVID-19 patients during the surge that occurred in mid to late February 2020 was closely monitored worldwide. American medical journals published several articles on how the Italian healthcare community responded (e.g., Grasselli et al., 2020). Based on projections, it soon became apparent that the number of patients in some U.S. cities would exceed available capacity. At healthcare centers such as New York's Bellevue Hospital, it soon became clear that the number of patients requiring care for COVID-related respiratory illness would exceed the number of intensive care unit beds and the number of ventilators (Filardo et al., 2020). Protocols for rationing care would be needed. In the United Kingdom, treatment allocation protocols, through NICE, which established guidelines for the use of interventions such as dialysis, had been in place for some time. However, in the United States, with the possible exception of transplantation (which uses a prioritization system), guidelines designating which patients do and do not receive treatment did not have an established history. Unlike European countries, which have a history of explicit or implicit rationing based on the physician's judgment of the likelihood of patient survival, U.S. health care leaves many decisions about treatment—particularly when suffering a potentially terminal illness—largely up to patients (Hurst, 2008). The United States allows patients to request healthcare interventions like cardiopulmonary resuscitation (CPR) that have a limited probability of success (Searight, 2019).

In Italy, the Italian Society of Anesthesia, Analgesia, Resuscitation, and Intensive Care (SIAARTI) published general guidelines for rationing medical equipment and levels of intervention specific to the COVID-19 pandemic. The underlying (utilitarian) principles were that treatment should be allocated based on the likelihood of patient survival and life expectancy (Craxi et al., 2020):

1. When the availability of resources is overwhelmed by their need, a decision to deny access to one or more life-sustaining therapies solely based on distributive justice may ultimately be justified.
2. Criteria for allocation should be flexible and adapted locally in response to available resources, the potential for patient transfer, and the ongoing or foreseen number of admissions.
3. An age limit for admission to the ICU may ultimately need to be set.
4. Together with age, the comorbidities and functional status of any critically ill patient should be carefully evaluated.
5. Every admission to the ICU should be considered and communicated as an "ICU trial." The appropriateness of life-sustaining treatments should be re-evaluated daily (Craxi et al., 2020, p. 327).

The British Medical Association explicitly addressed the conflict between utilitarian decision-making and physicians' deontological duty to the patient: "… If there is radically reduced capacity to meet all serious health needs, it is both lawful and ethical for a doctor, following appropriate prioritization policies, to refuse someone potentially life-saving treatment where someone else is expected to benefit more from the available treatment" (BMA, 2020 cited in Antova, 2021, p. 99).

In the United States, White and Lo (2020) developed a set of rationing criteria with accompanying numerical values. To address the principle of saving lives, they recommended adapting an existing system, the Sequential Organ Failure Assessment (SOFA) score, which has been shown to predict mortality among patients in hospital intensive care units. The SOFA score is based on clinical and laboratory data reflecting the functioning of six organ systems: respiratory, coagulatory (platelet counts), liver, cardiovascular, renal, and neurologic (Jones et al., 2009). Patients are given a score from one to four for each organ system.

In White and Lo's (2020) system for making COVID-19 treatment decisions, values were converted to scores ranging from one to four, with high scores indicating more significant organ dysfunction (e.g., a SOFA value of 12 or above corresponds to a score of 4). A second dimension is one where scores are assigned based on prognosis expressed in life years. There are only two scorable categories for this dimension which assumes successful treatment of the current acute illness—death within 5 years receives two points and death within 1 year, four points. The White and Lo (2020a) system yields scores ranging from one to eight. Patients receiving lower scores are judged to have a greater likelihood of survival.

White and Lo (2020a) included further prioritization principles. Priority in allocating scarce resources is given to essential workers in public health emergencies. White and Lo (2020a) defined "essential workers" as "…individuals who play a critical role in the chain of treating patients and maintaining societal order" (p. 7). They also prioritize younger people over older adults. They suggest the following categories for using age as a criterion: 12–40, ages 41–60, ages 61–75, and older than 75 (White & Lo, 2020a).

Ethical Problems with Medical Care Rationing Protocols

Age

Following an upsurge in COVID-19 cases, some European countries established age as a factor in determining who should receive mechanical ventilation. From the perspective of QALYS, a 25-year-old who is successfully treated for COVID-19 is likely to have a longer lifespan with better quality than a 75-year-old who has successfully been treated. The Swiss adopted an age cutoff of 85 for ventilation. In Italy, healthcare professionals were notified that they might need to use age as a criterion for limiting care. In Spain, there was some regional variation in treatment allocation policies. However, Spanish hospitals established a tentative age limit of 80 years, anyone over 80 years would not receive advanced life support, and those between 70 and 80 years old with moderate to severe comorbidities would probably not receive advanced life support (Herreros et al., 2020). In Great Britain, the NICE developed a COVID-19 decision support tool for NHS clinicians that included scores on multiple dimensions associated with a patient's potential survival with and without hospital treatment. For example, in the NICE algorithm, anyone over 70 was given "borderline" status for intensive care unit treatment. The United States has used age as a criterion for lung transplantation (Egan et al., 2006), but this argument has been contested. In the context of the pandemic, the U.S. Office of Civil Rights determined that age as a criterion for medical care was discriminatory (U.S. Department of Health and Human Services, 2020). The use of QALYs or assigning points based on a patient's anticipated lifespan has also been questioned since the ability to accurately predict long-term life expectancy is limited (Farrell et al., 2020).

During the lockdown and isolation of the Uusimaa region in Finland, it was recognized that older community members would be at higher risk for contracting COVID and dying. Many of these older individuals had summer homes outside of the isolated region. However, they were not permitted to move temporarily under the provincial lockdown. Doing so would have disrupted the containment strategy used by the government. However, it was noted that the decree which sealed off the region did not include protective measures for those at risk, such as the elderly. Indeed, this practice of isolation was seen as compromising that region's residents' lives to protect the rest of Finland—again, a practical strategy (Scheinin, 2020). There is evidence that immediately before the isolation of Uusimaa, many Finns left urban areas for regions that are "…well-known for seasonal residence" (Willberg et al., 2021, p. 11). This practice, in turn, was predicted to spread the virus (Willberg et al., 2021) and counter government efforts for geographic containment.

The “fair innings” principle has been invoked to support the use of age as a basis for rationing health. According to Farrell et al. (2020), the fair innings standard refers to the fact that young adults have not yet experienced many of life’s meaningful developmental milestones (getting married, having a family, establishing a career, owning a home). Those who have achieved these milestones are typically older and have already lived fulfilling lives. With all other factors equal, the standard would lead to intensive care unit beds and ventilators being given to the younger patient (Farrell et al., 2020). However, critics of the measures argue that “fair innings” implicitly provide more value to earlier than later stages of life.

An age-related argument invoked when vaccine supplies were limited implied that older adults were less likely to make valuable contributions to society. Since older adults were less likely to work in essential capacities and would not be as readily exposed to COVID-19, this line of reasoning would place them lower on the list for receiving vaccinations. However, in addition to raising questions about “productivity” being a standard for social worth, Farrell et al. (2020) also point out that close to 20% of people 65 years and older are primary caregivers for children and adolescents—a role that many would consider “essential.”

To those who argue that since younger adults are in overall better health and less likely to have chronic medical conditions, deontologists would raise the principle of the inherent worth of human life. Kant would counter the ageist argument with his categorical imperative that even when affected by cardiovascular disease or type II diabetes, no one’s life is more valuable than another person’s. Finally, perceptions of age are culturally relative. In sub-Saharan Africa, Ubuntu’s ethical model asserts that the most valued people demonstrate the highest levels of “character” (Cordeiro-Rodrigues & Ewuoso, 2022)—a quality acquired through age. Most adults over 65 in this African region reside in multi-generational households and are still employed and sharing income with extended family (Jecker, 2021). Ubuntu, as a practical philosophy, values “moral excellence,” which emerges in the context of an extended relationship network. This perspective would elevate an elder relative’s moral worth relative to younger adults (Cordeiro-Rodrigues & Ewuoso, 2022).

Health and Functional Status

Health, functional status, age, and disability status are unlikely to be completely independent. However, these criteria will be examined separately based on the response to the White and Lo criteria (2020a) and the use of functional status and health status as independent factors in many countries, such as the United Kingdom.

Frailty Indices

Frailty is a standard dimension used in assessing older adults. The emphasis is on how health impacts daily functioning. The most commonly used index is the Clinical Frailty Scale (CFS) that yields scores ranging from 1 (very fit) to 8 (terminally ill). The British agency, NICE, which encourages the use of the CFS with hospitalized and acutely ill older adults, suggests that the rating provides an index of patient resilience and helps assess whether the patient is likely to return to their pre-morbid level of functioning (Pranata et al., 2021) after resolution of their illness. While judgments of long-term prognoses for patients are not exceptionally reliable, a meta-analysis of CFS studies with COVID-19 patients concluded that each 1-point increase in frailty score was associated with a 12% increase in mortality (Pranata et al., 2021).

NICE included the CFS in algorithms for determining the appropriateness of ventilator support in COVID-19. Other countries, including Germany and Italy, used the patient's functional status and comorbid medical conditions as criteria (Jobges et al., 2020) for COVID-19 treatment allocation. Belgium considered the patient's cognitive status (Sarmento et al., 2022). Patients with a pattern of permanent or likely declining cognitive function were less likely to receive mechanical ventilation.

Frailty status has been shown to overlap with several diagnoses. Patients with more comorbid medical conditions score higher on the frailty scale. In COVID-19 patients, the Frailty Index predicts poor outcomes (Bellelli et al., 2020) and mortality among patients over age 65. However, some studies have suggested that the CFS has limited predictive value both for short-term prognosis and mortality.

NICE includes several caveats about the use of the Frailty Index. The scale should not be used in isolation from other patient information for making clinical judgments, and NICE does not recommend relying on the frailty index with patients under age 65 (Sablerolles et al., 2021). Clinicians are also cautioned about using the scale with persons with long-term physical disabilities such as cerebral palsy or those with cognitive problems.

Frailty scales should be used with caution when applied to atypical populations. Among persons with intellectual disabilities, the clinical frailty scale was questionably appropriate. Festen et al. (2021) found that nearly 75% of a sample of adults with intellectual disabilities were incorrectly determined to be too frail for a good outcome with life support.

Utilitarians would support the practice of ratings such as the CFS that can predict the level of disability after acute COVID illness resolves. Having a standardized assessment of functional status to determine the receipt of life support can be seen as consistent with the virtue of prudent health care with several caveats. First, the instrument must have established reliability and validity in the population to which it is applied. Second, the use of functional status ratings as part of decision-making for COVID-19-related treatment may be questionable with younger patients and those with long-standing physical or cognitive disabilities. Finally, scales such as the CFS should only be used in a holistic assessment process.

Disability Status and "Ableist" Bias

COVID-19 has led to persons with disabilities experiencing significant disruptions in services needed to maintain functioning at home and in the community. As a result of lockdowns and stay-at-home orders, some social service agencies contracted to assist persons with disabilities temporarily ceased operations. This reduction in pre-existing services was criticized as discrimination (Antova, 2020). In some locales, the pandemic triggered a shift in the criteria for determining eligibility for disability-related support services. With the implementation of the more demanding crisis standards of care, persons with long-standing disabilities were, in some instances, judged ineligible for benefits according to new, likely more stringent, standards of impairment and need—moderate, substantial, or critical (Antova, 2020). For example, persons previously receiving home health services or wheelchair assistance may not meet the new crisis standards of service need (Antova, 2020).

When persons with pre-existing disabilities develop COVID and require hospitalization, many treatment allocation guidelines directly or indirectly discriminate against them. Bagenstos (2020), in reviewing U.S. state policies for crisis standards of care in the context of the pandemic, found several instances of extreme ableism. He notes that before action by the DHHS Office for Civil Rights, Alabama's policy was that ventilators could be withheld from persons with intellectual disabilities. Washington State's guidelines also directly stated that younger, healthy individuals should receive ventilator support preferentially over older, "chronically debilitated" persons (Bagenstos, 2020, p. 2).

A variation on QALYs, the Disability Adjusted Life Years (DALYs) index combines the years lost due to premature death and the future years of life adjusted for the intensity and duration of physical or mental disability (Rushby & Hanson, 2001). Each year someone who lives with a disability such as visual or hearing impairment or physical condition restricting mobility would receive a lower score compared to a "typical" person (Andrews et al., 2021). DALYs are reported at the population level. For example, in comparing multiple causes of disease and injury in Scotland, during 2020, COVID-19 was responsible for an estimated 90,500 to 108,200 DALYS—second only to ischemic heart disease (Wyper et al., 2022). However, the perspective or benchmark of DALYs is that of a person without a disability. Typical individuals, not having the subjective life experience of someone with a disability, render the use of DALYs for treatment allocation highly questionable (Andrews et al., 2021). Deontologists would raise serious concerns about any system that denotes that one person's life is worth less than another.

Unfortunately, persons with preexisting disabilities are caught in the net of utilitarian criteria for allocating care. As noted above, to return to their previous level of functioning. Antova (2020) points out that this is a definition based upon the elderly and has limitations in adapting to younger people with chronic physical disabilities. From the perspective of disability rights, these criteria reflect ableism, the notion of an idealized view of how people should physically and cognitively function (Antova, 2020). Rather than a functional level, an alternative, yet still utilitarian, approach would be prioritization based on the most beneficial criterion. In this context, "beneficial" could mean those most likely to remain alive to hospital discharge. One could still use these criteria with persons with pre-existing disabilities, and it is argued that it may be less discriminatory. Another less biased strategy for treatment allocation would be the use of a lottery (Andrews et al., 2021). This strategy would treat all lives equally without any implications of social worth.

Comorbid Medical Conditions

Comorbid health conditions have been widely used for decision-making for admitting acutely ill patients with COVID-19 to intensive care units and providing them with mechanical ventilation. Internationally, data on COVID-19 and comorbidities shows considerable variation across countries. The percentage of COVID-19 patients without comorbid medical conditions in South Korea, Wuhan, China, and Denmark ranged from 33.1% to 76.3% to 65%, respectively, compared with the United States at 27.4% (Kim et al., 2021). A numerical measure of comorbidity employed in assessing patients with COVID-19 is the Charlson Comorbity Index (CCI; Charlson et al., 1987). The Charlson Comorbidity Index assigns point values to each diagnosis on a list of predominantly chronic illnesses. However, the Charlson list includes lymphoma, AIDS, solid metastatic tumors, and dementia (Charlson et al., 1987). Recent studies suggest that among patients with COVID-19, the CCI is one of the strongest predictors of adverse clinical outcomes (Kim et al., 2021).

However, using comorbid conditions to make triage decisions among COVID-19 patients quickly became highly controversial. Conditions such as Type II diabetes and cardiovascular disease are more prevalent in certain ethnic and cultural minorities. Because the disease burden falls more heavily upon minorities, there were serious issues with this factor determining whether someone receives life-saving treatment. In many countries, the disproportionate prevalence of chronic illness in minority populations reflects long-standing structural inequalities, including discrimination, racism, colonialism, and poverty. While access to health care is a significant factor in the excess morbidity and mortality found among minorities, health inequality is present in countries such as Canada and the United Kingdom with universal medical coverage. COVID-19 cases in European nations are distributed in two tiers. In a similar pattern as seen in the United States, COVID-19 in the United Kingdom has disproportionately impacted migrants and ethnic minorities who have rated their health as poorer than the majority population (Nielsen & Krasnik, 2010). In the United States, the COVID mortality rates among Blacks are 1.7 times and Native Americans 2.1 higher than for Whites (Centers for Disease Control, 2022). In Canada, Black men and women had COVID-19 death rates 2–3× that of "non-racialized" Canadians (Guptka & Aitken, 2022). Furthermore, some European countries have provided a less aggressive approach to COVID-19 treatment for ethnic minorities and refugee/migrant groups (Kumar et al., 2021). While conditions such as cardiovascular disease are associated with poorer outcomes among

COVID-19 patients, these illnesses are vastly over-represented among racial and cultural minorities. Using criteria such as the Charlson score disqualifies a disproportionate number of Black patients from receiving optimal care for COVID-19. Events such as the U.S. Public Health Service's Tuskegee syphilis study, in which Black men with syphilis were followed for four decades without receiving treatment, have led to African-Americans' frequent distrust of health care institutions (Bajaj & Stanford, 2021). These factors and the inability to regularly obtain health insurance have led to a long-term pattern of implicit health care rationing. In Canada, Afro-Canadians, and First Nations members are more likely to live in areas with significant environmental health hazards (Van Sant, et al, 2021) which may predispose them to poorer COVID outcomes. Among U.S. military veterans, exposure to environmental toxins mediated the relationship between ethnic/racial disparities and hospitalizations for COVID-19 (Wong et al., 2022). Among Canada's aboriginal peoples, more significant mortality has been associated with environmentally related mercury exposure (Venkataraman et al., 2022). A Rawlsian model of distributive justice might suggest that a lottery should be used to determine which patients received more aggressive care. While seeming to meet the definition of fairness, making allocation decisions behind "the veil of ignorance" assumes that a baseline of acceptable health exists for all. As is evident, this assumption is not valid.

Groups Granted Preferential Status

In many of the algorithms prioritizing specific groups for treatment, health care providers were at the front of the line. However, while there was general agreement internationally about this principle, there were variations in the underlying reasons for preferential treatment. As highly valued and needed professionals during the pandemic, physicians and nurses required priority treatment to return to their duty of treating sick COVID patients. Emanuel et al. (2020) indicated that a decision to prioritize healthcare workers for treatment is not based upon social worth but on their "instrumental value." They note that physicians and nurses who could not work because of illness would indirectly increase the lives lost among patients. The criterion of preferential treatment is one of the few places in bioethics where deontology and utilitarianism could conceivably converge—giving health care providers priority treatment and returning them to fulfill their duties as physicians and nurses (deontology) by treating patients and saving the most lives as soon as possible (utilitarian). In addition, a virtuous nurse would want to return to their duties as quickly as possible out of fidelity to patient care, compassion, and self-effacement (Pellegrino & Thomasma, 1993).

During the pandemic, health care providers caring for patients worldwide were hailed as "heroes." A "hero" follows Kant's categorical imperative and exhibits multiple virtues but without any expectation of reward or even recognition—"it is all part of the job" (Jeffrey, 2020). There were some gestures of reciprocity for these sacrifices in the form of preferential access to vaccines when they came available.

Additionally, in some American states, nurses and physicians were given special protection against malpractice litigation for circumstances surrounding COVID-19 patients' deaths (Koch & Hoffmann, 2021).

Cox (2020) questions whether, for health care providers, being called a "hero" may have done more harm than good. The workload and the hours were often well beyond customary medical practice. In addition, if and when they returned home after a long hospital shift, health care providers often had to isolate themselves to protect their families. One perhaps extreme example was a group of nurses in China who had their heads shaved. The purpose was reportedly to reduce infection transmission and to be able to change into protective clothing more rapidly (Smith et al., 2020). While the "official" photos were accompanied by descriptions of the nurses' willing sacrifice to protect patients, other information suggested that altruism was not the motive for some of these young women. There were reports that some nurses were not asked or given prior notice of their hair being cut off. In one photo, a woman who appears to be a nurse was crying as her hair was cut off. As Cox (2020) points out, the hero ethos prevented an open discussion about the limits of health care providers' duties. Additionally, should these "heroes" have received some form of reciprocity for their efforts other than not being the subject of a lawsuit? At a minimum, these benefits could include an adequate supply of employer-provided personal protective equipment, availability of mental health support, compensation if they become ill, and financial support for their families should they die from COVID themselves (Cox, 2020).

Aside from health care workers, another group recommended for preferential status based on the principle of reciprocity were volunteers for the COVID-19 clinical vaccine trials. Those who had participated in vaccine trials were considered higher priority for receiving any needed life-sustaining treatment. The reasoning is that these research subjects contributed to the common good, but at some risk to themselves since, during clinical trials, all possible adverse events are not usually known. In addition, persons providing viral samples and undergoing repeated testing as part of surveillance should be prioritized. One reservation about this reasoning is that there are segments of the population who, based on history, have genuine hesitation about participating in biomedical research. Historically, the African-American and Canadian First Nations communities have been non-consenting participants in multiple clinical studies and sustained harm as a result. This history is also a factor in contemporary structural inequalities.

A Revised Algorithm for Allocating Scarce Treatment Resources

To their credit, soon after these issues became apparent, White and Lo (2021) developed a revised treatment decision algorithm with a modified set of criteria. They accompany their revised algorithm with a reflective description of the importance of addressing structural inequalities in allocating scarce resources. They acknowledge the reality that the original algorithm they had put forth earlier (White & Lo, 2020a) would save the most lives. However, they attempt to address social justice while retaining some functional elements. White and Lo (2021) seem to recognize the validity of criticisms of age, frailty, and comorbidities in allocating treatment. However, they maintain the format of quantitative triage assessment based on the belief that a quantitative algorithm, even when modified for inequalities, would save more lives than a lottery or first-come-first-served approach.

In their revised decision tree, White and Lo (2021) retain and expand upon the "preferred" status for health care workers; in terms of who would receive priority, they recommend extending that category to include anyone considered an essential worker by state or federal guidelines. This category could consist of retail employees, bus drivers, and food service workers. This revision gives greater representation to the many essential African-American and Latinx employees who had to work during the pandemic out of economic necessity.

During the first year of the pandemic, while African-Americans comprised approximately 13% of the U.S. population, they comprised 32% of COVID-19 hospitalizations and had a significantly higher fatality rate than White COVID-19 patients. White and Lo (2021) included a quantitative correction factor as an attempt to offset structural inequalities. White and Lo (2021) applied the Area Deprivation Index (ADI) based on the neighborhood census block in which a patient resides. The ADI dimensions include educational level, employment, physical environment, and infrastructure. There are computer programs in which a patient's address is entered and a score computed. Using a geographic indicator rather than race/ethnicity reduces the likelihood of legal issues regarding racial discrimination (White & Lo, 2021).

Dimensions such as quality of life or long-term life expectancy are not part of the revised algorithm. While recognizing that the sequential organ failure assessment (SOFA) may have some limitations, White and Lo (2021) believe that the SOFA still has merit. As noted above, the SOFA does have research support and predicts mortality. Schmidt et al. (2022) highlight one element of the SOFA score that is relevant for treatment allocation. Creatinine levels indirectly reflect kidney function. In the SOFA system, a creatinine level of <1.2 mg/dl receives "0" points toward denial of a ventilator. A creatinine level of 1.2–1.9 receives 1 point and moves the patient close to being denied life-sustaining care. However, research suggests that, in general, average creatinine levels are higher in African-Americans and possibly associated with greater muscle mass (Peralta et al., 2010). This factor should also be taken into account if using the SOFA system.

Age is retained as a dimension; if two patients have equal triage scores and only one intensive care unit bed or ventilator is available, the younger patient would receive it. White and Lo (2021) responded to the criticism that introducing a correction factor for healthcare disparities would lead to fewer lives saved than their previous strictly utilitarian algorithm by referencing the principles of justice: "In our view, when society is substantially responsible for creating disparities through unfair social policies, there is a special obligation to prioritize disparity mitigation, even if doing so results in somewhat fewer overall lives saved compared with purely utilitarian triage" (White & Lo, 2021, p. 292).

As another strategy to offset the harm of structural inequalities, White and Lo (2021) recommend changes in hospital policies. At the state or federal level, hospitals that have generally been "safety net" facilities serving more disadvantaged patients should be prioritized for receiving additional equipment such as face masks and ventilators. Additionally, White and Lo (2021) believe that policies should be implemented to encourage the transfer of patients to less populated hospitals when necessary. For example, suppose the local safety unit hospital is overwhelmed. In that case, disparities in treatment and outcome could be served by having the ability to transfer patients to a less populated, yet nearby, private hospital or having the flexibility to transfer patients to facilities across state lines.

Who Should Make the Final Decision About Rationing Care?

The question of who should decide about treatment is a critical ethical question in rationing. Those involved in rationing decisions included interprofessional teams, critical care teams, and senior physicians. When hospitals were overwhelmed with COVID-19 cases in Italy and France, treating physicians were initially required to make these decisions based on utilitarian principles of minimizing deaths and maximizing life years (Orfali, 2020). In France, it was recommended that intensive care physicians have an ethics consultant available for complex cases (Orfali, 2020). In reality, triage decisions varied by the hospital, and in Italy, age cutoffs were established, often at age 80 or 75. Early in the pandemic, a conflict of interest principle was quickly recognized. The absence of a centralized set of treatment allocation guidelines was reported to trouble some Italian physicians who spoke openly about the moral distress they were experiencing. In doing so, some of these providers were reprimanded by their hospitals (Orfali, 2020). In France, these decisions were often made informally simply by not admitting older patients to the hospital or, if admitted, not transferring them to intensive care units. It is reported that a similar process occurred with persons with disabilities. One rationale put forward to defend the practice with older patients was that they would not respond well to ventilation (Orfali, 2020).

The rationing of care during the pandemic presented a significant risk of moral injury to health care providers. Repeated episodes of moral distress (Akram, 2021) can lead to the more enduring syndrome of moral injury when the health care provider is "… witnessing, failing to prevent, carrying out, or learning about acts in healthcare that transgress deeply held moral beliefs…" (Akram, 2021, p. 2). Thomasma (1990), writing from the perspective of virtue ethics, notes that when a patient's physician is participating in decision-making around rationing of care, the physician ceases to represent the patient's best interests. In essence, the provider has abandoned the virtue of fidelity to the patient. When placed in this situation, in keeping with the values of integrity and honesty, the clinician should explicitly inform the patient that their best interest is no longer the sole guide to decision-making. Similar to Kant's categorical imperative, Thomasma (1990) argues that patients are in an inherently vulnerable state, and a rationing system based on specific patient qualifications such as the likelihood of survival "…diminishes the intrinsic value of human life…" (Thomasma, 1990, p. 253).

In contrast to the physician-centered process in some European countries, U.S. COVID rationing guidelines consistently stated that a third party, not directly involved in the patient's care, should make these decisions (Emanuel et al., 2020). White and Lo (2020a) recommend that triage be conducted by "an acute care physician triage officer, supported, [and if available]... an acute care nurse and administrator …" (White & Lo, 2020b, p. 1). Probably the most emotionally charged and morally wrenching scenario involves removing a ventilator from an ill patient with a less than optimal prognosis to use it for a younger patient with few other health issues. Deliberate withdrawal of care from a seriously ill patient is not the same as not initiating care for the same patient. Withdrawal is an intentional act resulting in the patient's death rather than a passive decision. Again, using a protocol by an educated and trained team that is not directly involved in the patient's care would be the optimal approach. By separating direct clinical care from administrative decisions about resource allocation, healthcare providers maintain their fiduciary duty to patients (Butler, 2020) and are less likely to experience moral distress. One possible solution for future health care crises is for hospitals, to establish ethics committees if not already present. In the United States, a hospital ethics committee is required by the Joint Commission on Accreditation of Health Care Organizations and is strongly supported by the American Medical Association. If membership included physicians, nurses, and professionals with a strong background in medical ethics, these already existing committees could conceivably serve a triage function.

Code Status, Cardiopulmonary Resuscitation in the Context of COVID-19

Emergency cardiopulmonary resuscitation (CPR) in U.S. hospitals is typically referred to as a "Full Code" and may include intubation if warranted to keep the patient alive. If these interventions are not desired by the patient, they are given Do Not Resuscitate (DNR) status. In the United States, in keeping with the value of autonomy, upon hospital admission and before undergoing a surgical procedure, the patient or their surrogate are asked: "If your (or the patient's) heart stops, should the medical staff do everything possible to resuscitate you (the patient)?" When the question is worded as such, the majority of patients and decision-makers will request "full code" status.

Performing emergency CPR in a hospital with many patients infected with COVID-19 raises significant moral concerns. From the perspective of deontology and a patient's right to self-determination, the medical staff's response to a "code blue" is an automatic duty. Having witnessed teams rush to a patient's room to begin CPR, there is a singular focus on saving the patient's life. "Calling a code" in a hospital involves a medical team being urgently summoned to the patient's bedside to provide CPR. Unfortunately, most attempts at CPR in the hospital are unsuccessful in the short-term. The survival rate of hospitalized COVID-19 patients receiving

CPR is low. A pre-pandemic meta-analysis reported an average one-year survival rate of 13%. Among COVID-19 patients in a New York hospital, the comparable rate was 1.7% (Aldabagh et al., 2021). There is evidence that patients and their families view the intervention as much more successful than it is in reality (Marco & Larkin, 2008). Studies suggest that this perception is shaped by popular television shows in which most patients are successfully resuscitated and able to leave the hospital (Diem et al., 1996).

For the health care professional, a deontological duty to preserve life, in the hospital context of COVID-19 crisis care standards, creates a significant risk of moral and physical harm. Hospital-based CPR is also personnel intensive, with a team of physicians, nurses, and other allied health professionals frequently involved. In addition to its limited success, CPR in a setting where patients with COVID are being treated presents elevated risks of infection to medical staff (Sultan et al., 2021). Early in the pandemic, some institutions did not have adequate personal protective equipment, further heightening the risk. From a utilitarian perspective, calling a code also temporarily removes health care personnel from caring for patients with a greater likelihood of survival. From a quantitative cost-benefit perspective, "full codes" are high risk and low benefit. It has been suggested that the risks and low success rate be part of the discussion when raising the issue of code status with patients and their families.

Conclusion

COVID-19 has brought ethical theory to the foreground in international health care. It is hoped that the clinical dilemmas raised will encourage medical schools and residences to devote more time to ethics education. When one hears the global appraisal "That would be unethical," the response should be "Unethical from which perspective?" The pandemic seriously challenged the norm of the autonomous patient who makes choices about their care and a physician who has a fiduciary responsibility to them alone. Public health's ethical utilitarianism became more prominent in moral decisions about limiting individual freedom and medical treatment options. The pandemic has contributed to increased critical analysis of individualism versus responsibility for the community's welfare.

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Chapter 8
Vaccines and Vaccinations

H. Russell Searight

Introduction

The vaccine for COVID-19 was developed much more quickly than most previous vaccines for infectious disease. As of this writing (October, 2022), the duration of the primary COVID-19 vaccine's effectiveness in preventing symptomatic illness has been estimated to be four to 6 months. With an additional booster, symptomatic protection from the Omicron variant was estimated to last at least 4 months, with effectiveness declining by 24% between one and 4 months (Higdon et al., 2022). Vaccinated individuals who develop COVID-19 are less likely to have long COVID (Mahase, 2022). Additionally, those with comorbid conditions may have better outcomes if they develop COVID after having been vaccinated (Papagoras et al., 2022).

Prior to COVID-19, a wide range of social, economic, and ethical issues had arisen regarding vaccination. Beginning in the 1990s, there had been a growing anti-vaccination movement in the United States and much of Europe. With a 100-year history of organized opposition to vaccination, the anti-vaccination movement has become increasingly prominent and vocal in recent decades. Dr. Andrew Wakefield's erroneous and eventually retracted study indicating that vaccines cause autism fueled the vaccine hesitancy movement. While this study has been effectively debunked, and Wakefield has lost his certification to practice medicine in the United Kingdom, many people still believe that vaccines cause autism. In 2016, during the Republican Primary Presidential Debates, Senator Rand Paul, Mr. Trump, and Dr. Ben Carson all seemed to agree that vaccines could harm children. Dr. Carson commended Trump publicly on the debate stage for being "a good doctor." As conspiracy theories involving organized medicine, the pharmaceutical industry, and the

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government began to grow, vaccinations and vaccine-related issues became a hot topic, particularly when strongly recommended or mandated by state, local, and national governments, as well as by schools and universities.

The current chapter begins with a summary of the stages of vaccine development, followed by a brief history of vaccine development and vaccination programs. Finally, issues regarding vaccine hesitancy—in general, and with respect to COVID-19—are described in some detail. As will become apparent, the anti-vaccination movement has been present in the United States and Europe for over 100 years. From an ethical perspective, controversy surrounding mandated vacinations center on the tension between the collective good and individual autonomy. As a result, requirements for vaccination and documentation of vaccination status became political issues and remained a source of considerable public controversy.

Vaccines: A Brief Overview

The first vaccines were mainly inactivated viruses. Heat or other methods were used to kill the pathogens that cause diseases. Polio vaccines were available in this form. Attenuated vaccines, on the other hand, use weakened versions of pathogens. Examples include measles, mumps, and rubella (MMR) vaccines. Vaccines containing antigens but no other cellular components (Centers for Disease Control, 2022) have also been developed recently. By generating proteins from laboratory-produced mRNA, mRNA vaccines stimulate the immune system. This principle is the basis of the majority of COVID-19 vaccines. Coronaviruses contain spike proteins that mRNA vaccines can target.

Immunization activates white blood cells like macrophages, B lymphocytes, and T lymphocytes. As a result of their ability to recognize antigens released during infections, including those caused by vaccines or mild infectious conditions, B-lymphocytes and T-lymphocytes are called memory lymphocytes. Vaccination-related symptoms include headaches and mild fevers (Centers for Disease Control, 2022). After vaccine receipt, it may, however, take several weeks for an immune response to develop fully.

Vaccines are initially tested on animals to determine their safety and ability to elicit an immune response. A vaccine is tested in three phases in human clinical trials to determine if it triggers an immune response (Centers for Disease Control and Prevention, 2023). The vaccine is administered to volunteers in phase 1 to decide whether or not it is safe, generates an immune response, and to determine the dosage. Vaccines are tested on healthy young adults in this phase. To assess safety and immune response, phase 2 involves vaccinating several hundred volunteers. Trial participants must reflect the demographic characteristics of those who will receive the vaccine (such as gender and age). At this stage, vaccine formulations are usually tested on various age groups. To determine whether the vaccine is responsible for changes in the vaccinated group, including adverse reactions, phase 2 often includes a control group. The vaccine will then be given to thousands of volunteers in phase

3, so it can be tested for effectiveness and safety. As a control, a similar group of volunteers receives some type of placebo – a saline injection instead of the vaccine or a sham vaccination (Rid et al., 2014). Vaccine development has traditionally taken 10–15 years. Pharmaceutical companies often do not prioritize vaccine production due to its high cost, the inherent risk of potential adverse effects, and minimal profit margin.

A vaccine for mumps was the fastest to gain approval among common vaccines, taking only 4 years from the discovery of the antigen to the vaccine's availability. Most recently, a vaccine for the Ebola virus completed clinical trials within a year—although it remains a candidate for use along with several other vaccines (Marzi & Mire, 2019). For the COVID-19 vaccine, the time from development to widespread use was expedited. At least half of the trial participants were given an "emergency use authorization," reducing the follow-up monitoring period from 6 months to 2 months after vaccination.

Vaccines: A Brief Social History

Human vaccines reduce the impact of contagious diseases. Contagion, by its very nature, is a social phenomenon and "… elicits a sense of danger, risk, invasion, and vulnerability" (Casper & Carpenter, 2008, p. 887). Human vaccination dates back to ancient China and India. At that time, smallpox was a major cause of death—a condition dating back to 1500 BC among the Egyptians. The practice of variolation, in which the crust of smallpox pustules was deliberately inhaled or injected into infected individuals to protect them against the condition, initially developed in Asia. During the late 1700s, George Washington recognized the importance of smallpox vaccinations.

Washington had contracted smallpox as an adolescent (Sidel, 1986). As commander of the Continental Army, he was aware that most British soldiers had been exposed to the disease in England, where herd immunity had been achieved. Washington knew that smallpox could decimate the Continental army. Therefore, during the Revolutionary War, Washington had his army variolated with material from active smallpox lesions typically by making an incision in the skin and inserting a thread into a smallpox pustule. It is estimated that up to 10% of those undergoing this form of vaccination would die. Additionally, inoculated individuals might infect those who had not been vaccinated during active illness. However, Washington's utilitarian calculations concluded that more soldiers would be saved through vaccination than those who would die if no protection against the disease was provided.

Variolation was soon replaced by the more formal inoculation developed by Jenner in the late 1700s. Jenner used cowpox which he deemed to be closely associated with smallpox, through his observation that "milkmaids" who were exposed to cowpox did not appear to subsequently develop smallpox (Lombard et al., 2007). When Massachusetts enacted the first mandatory vaccination law in 1809, the smallpox vaccine became the first required vaccine in the United States. In addition, vaccination for smallpox became a requirement for all infants in the United Kingdom by the mid-nineteenth century. Around the same time, Massachusetts implemented mandatory smallpox vaccinations for school children (Riesmeyer & Feemster, 2020).

Vaccines were used in the 1800s for disease prevention. However, the practice of medicine was not well-regulated at this time, and many medical schools were "diploma mills." During Jacksonian America in the 1820s, Americans used various healing techniques, such as phrenology, faith healing, and homeopathy (Stepansky, 2019). Ancient Greek medicine became recognized again during the Enlightenment. According to the ancient Greeks, all diseases could be attributed to an imbalance in humors within the body. The belief later re-merged and was prevalent during the 1820s and 1830s. This explanatory model led to techniques that restore humoric balance, including bleeding and deliberately induced vomiting.

Vaccines for farm animals were developed in the late 1800s, preceding the development of additional human vaccines. By the mid to late 1800s, vaccines were developed with animals and tested on humans. Louis Pasteur developed a vaccine in the 1870s for chicken cholera, followed by the anthrax vaccine for sheep and cattle. Later, Pasteur developed a vaccine for rabies, a condition of animals that could be fatal to humans (Lombard et al., 2007).

However, there was a view that taking in the products of a horse, cow, or sheep into the human body was disgusting and sinful. Once it became known to the public that these vaccines were developed on animals, there was some resistance to vaccination. For example, animal-based vaccines were not well received in India (Lombard et al., 2007). Hindus who view cows as sacred in India were reluctant to receive a vaccine developed on bovine material (Lombard et al., 2007).

Koch's work influenced the conceptual process of vaccine development and treatment of contagious diseases. In terms of establishing an etiological agent, Koch's systematic series of steps brought a set of logical principles for establishing the cause of infectious disease and measures to reduce its spread. These principles influenced the development of the COVID-19 vaccine. While his initial principles have since been modified (Pimentel, 2010), Koch's original four postulates are as follows:

1. The microorganism must be found in abundance in all organisms suffering from the disease but should not be found in healthy organisms.
2. The microorganism must be isolated from a diseased organism and grown in pure culture.
3. The cultured microorganism should cause disease when introduced into a healthy organism.
4. The microorganism must be isolated from the inoculated, diseased experimental host and identified as being identical to the original specific causative agent (Huebner, 1957; Tabrah, 2011).

While tuberculosis is a mycobacterial rather than a viral illness, it was also targeted for vaccine development. By the 1920s, a vaccine for tuberculosis was available. The Bacille-Calmette-Guerin vaccine is the most widely used today. However, because of its variable efficacy, tuberculosis vaccines continue to be studied (Luca & Mihaescu, 2013).

The next recommended vaccines were also developed early in the first half of the twentieth century. These included vaccines that protect against pertussis (1914), diphtheria (1926), and tetanus (1938). These three vaccines were combined in 1948 and given as the DTP vaccine.

As described in Chap. 1, polio was a significant problem during the first half of the twentieth century. In particular, it often afflicted children; in some cases, children would have to spend the rest of their lives on a sizeable respirator—the iron lung. Approximately 2 years before the great influenza epidemic, there was an epidemic of polio in New York City, resulting in paralysis for 3500 people, with the death toll at 900 (Offit, 2007). While the mortality rate for those infected with polio is typically about 5%, this New York City strain in the summer of 1916 was associated with a 27% death rate (Offit, 2007). The virus responsible for polio was isolated in the 1940s. By the early 1950s, the United States experienced another large-scale outbreak, with 58,000 citizens being affected. In 1953, several days before his research findings on an inactivated virus vaccine were published, Jonas Salk appeared on national television. He described the positive effects on antibody production associated with his vaccine. Salk received substantial criticism from the scientific community for presenting unpublished data to a national audience. Salk's vaccine was associated with a small risk of developing polio. Working independently, Albert Sabin developed a vaccine based on an attenuated virus and administered it to 90 million Russian citizens (Offit, 2007). There are still pockets of polio outside of the global North—particularly in parts of Africa and the Middle East. Ongoing vaccine efforts are present in these regions. There has been recent concern that the condition may have a resurgence because of increased reluctance to vaccinate children combined with increased international travel. As of this writing in August 2022, polio has been detected in New York wastewater with one person in the region developing polio-related paralysis (Brown, 2022).

The first measles vaccine became available in the United States in the early 1970s. However, because of vaccine hesitancy and international travel from regions where measles still is endemic, Global North countries such as the United States have had recent local outbreaks (Phadke et al., 2020). A measles vaccine was initially developed in the mid to late 1950s. However, the early measles vaccine had significant side effects. In 1968, Maurice Hileman developed a measles vaccine with significantly fewer side effects, and in 1971, combined the measles, mumps, and rubella vaccines into one (MMR) (World Health Organization, 2022).

As will be discussed further, vaccinations have become the target of significant controversy-particularly the policy of mandating vaccination for school attendance. Vaccine reluctance has moved from the scientific and religious realms to a political debate with occasional moral overtones. These issues arose in the late 2000s around a newly developed vaccine (Gardasil) for the human papillomavirus (HPV), a sexually transmitted infection (STI). HPV is a major etiological factor in cervical cancer. The FDA approved the first HPV vaccine in 2006. After the Association for Professionals in Infection Control and Epidemiology (ACIP) recommended three doses of the vaccine for girls aged 11–12, approximately 20 U.S. states reviewed the health data and considered mandatory vaccinations (Udesky, 2007). At that time, the HPV vaccine had not yet been approved for boys. When conservative Texas Governor Rick Perry established an executive order for all 11-year-old girls to receive the vaccine, controversy erupted (Udesky, 2007)—even more so when Perry's order was given national attention. Issues around adolescent sexuality and the role of government in mandating health behavior that some said were in the parental domain continue today.

Mandated Vaccinations

As noted above, laws mandating vaccinations in the United States and the United Kingdom date back to the early to mid-1800s. These policies coincided with the rise in requirements in Western Europe and the United States that minors receive free public education. The initial vaccination requirements were for smallpox. While Boston was the first major U.S. city to require that school children be vaccinated, it was soon followed by New York, Connecticut, and Pennsylvania. Despite laws requiring smallpox vaccination, compliance was often an issue. For example, in an English community in 1890, while a school vaccination policy was in place, there was an outbreak of smallpox traced to several unvaccinated elementary school children. As a result of the episode, 484 people died (Hodge & Gostin, 2001). The legal consequences for parents and children of unvaccinated students could be significant fines, the possibility of parental incarceration, and barring children from school attendance (Hodge & Gostin, 2001).

Public health officials could be quite aggressive in efforts to secure vaccinations and, when appearing at the homes of those unvaccinated, were, at times, accompanied by the police. An account provided by Hodge and Gostin (2001): "Dr. Henry R. Schilling visited [Schaefer's house] April 27, 1894, and said he had come to vaccinate the family. Schaefer objected and said that he was suffering from a tumor on the brain, and thought it would be dangerous to be vaccinated. According to Schaefer's story, Dr. Schilling seized him by the arm, and exclaimed 'You shall be vaccinated if I die for it'" (New York Times Times, 1895; cited in Hodge & Gostin, 2001, p. 845).

Historically, the U.S. courts have generally supported vaccination requirements. In a 1965 case that went to the Supreme Court, Henning Jacobson challenged the constitutionality of a Cambridge, Massachusetts, statute for citizens to be vaccinated for smallpox. After the Massachusetts Supreme Court upheld the municipality's penalty, a five-dollar fine, Jacobson appealed to the U.S. Supreme Court, which also ruled against him. Jacobson argued that compulsory vaccination laws interfered with an individual's right to care for their own body and were a form of government oppression. In ruling against Jacobson, the Supreme Court asserted that a sole focus on individual liberty ignored possible injuries to others.

During the 1960s and 1970s, influenced by the dramatic decline in measles associated with vaccination, many school districts implemented policies requiring children to be vaccinated for childhood illnesses to attend school and became more aggressive in enforcing these rules (Riesmeyer & Feemster, 2020). Data presented by Riesmeyer and Feemster (2020) suggest that these consequences could be very effective. For example, when Alaska's public schools required proof of vaccination to begin the school year, a little over 8% of children could not provide this verification and were not permitted to attend. Within a month, this figure fell below 1% (Riesmeyer & Feemstra, 2020). By the 1990s, all 50 states required students to be vaccinated to attend school.

Medical exemptions to mandatory vaccination are permitted in situations in which the child could be susceptible to adverse effects of the vaccine—primarily because of a pre-existing medical condition. Religious exemptions have been allowed, and a minority of states accept "philosophical objections" and permit unvaccinated children to attend public schools (Hodge & Gostin, 2001). These exemptions have become increasingly variable within the United States.

Internationally, there is considerable variability in policies requiring vaccination for school attendance. For example, school children are not required to be vaccinated in Australia. However, the government encourages childhood vaccination by paying parents if their child is vaccinated ($129.00 for required vaccines at 12–24 months). Slovenia requires the MMR and hepatitis B vaccine before children can attend school. Mandatory polio vaccination is required before age 18 in Belgium (Walkinshaw, 2011).

Episodes of Vaccine-Related Harm

For those who refused COVID-19 vaccination because of the potential for physical harm, they can point to several historical episodes when vaccines caused severe illness and deaths. These events have typically been attributable to defects in the vaccine itself. Publicized adverse reactions to vaccines have a history dating back at least to the early 1900s. The "Lubeck Disaster" refers to deaths associated with the tuberculosis vaccine in the late 1920s to early 1930s in Lubeck, Germany. The new (at the time) Bacille-Calmette-Guerin (BCG) vaccine was given to 251 newborn infants (Fox et al., 2016). Of this group, 173 developed tuberculosis by clinical or radiological indicators but survived. An additional 72 infants died from tuberculosis. Initially, the vaccine itself was blamed for these cases. After a good deal of investigation, it was determined that the vaccine was contaminated with active, virulent *Mycobacterium tuberculosis*. The variability in infant outcomes suggested that there was likely a genetic resistance to tuberculosis that varies across populations (Fox et al., 2016).

An incident known as the "Cutter Incident" likely contributed to recent vaccine hesitancy (Offit, 2007). After receiving the Salk vaccine in 1955, some children developed polio. Following the outbreak of 40,000 cases of polio caused by the defective vaccine, it was discovered that the virus had not been adequately inactivated. Despite Salk's specific protocols for inactivating viruses (Fitzpatrick, 2006), Cutter laboratory workers reported that the written guidelines were too vague (Offit, 2007). Inadvertently, the Cutter company created a vaccine with active virus. As a result of the vaccine reaction, 200 children developed some form of paralysis, and ten died (Fitzpatrick, 2006). Historically significant, this was the first time a pharmaceutical company was legally obligated to compensate victims of defective vaccines. It is likely that this factor, along with the ease of administering an oral polio vaccine, contributed to the Sabin oral vaccine, based on an attenuated virus, becoming more popular (Stratton et al., 1994). In addition, it increased the federal regulation of vaccines for humans. Many companies abandoned vaccine research and development after the Cutter incident due to concerns about litigation, as well as a relatively low-profit margin associated with vaccine production (Fitzpatrick, 2006). In addition, before developing vaccines for mass government-based programs, companies typically require a release preventing the company from being held liable for any adverse outcomes. This concern was an issue with the development of the swine flu vaccine in the mid-1970s.

The first suspected case of swine flu was detected in early 1976 in Fort Dix, New Jersey, as described in Chap. 1. The public health service and other health advisors were concerned that swine flu could lead to a U.S. pandemic similar to the 1918 influenza outbreak and recommended to President Ford that a mass vaccination program be carried out as soon as possible. Despite being a young child at the time, Ford had some memory of the influenza epidemic of the early twentieth century. Swine flu emerged during a presidential election, similar to President Trump's situation with COVID-19. Even though the swine flu vaccine was available within several months, the mass vaccination plan required congressional approval. In addition, while initially agreeing to do so, the pharmaceutical companies involved in swine flu vaccine production later indicated that they would not release the vaccine unless they were protected from liability. As a result of the publicity surrounding this request, U.S. citizens were left with many questions (Begley, 1977). If liability concerns were so important, it was feared the vaccine had the potential to cause harm. Finally, in March 1976, Ford announced the mass vaccination program. The mass vaccination program was launched in early October, right before flu season. In the weeks leading up to the election, the launch took place. All Americans were encouraged to get vaccinated after President Ford received the vaccination on television. A few weeks afterward, 35 older adults died after receiving the vaccine. Health officials denied any links to the vaccine, In addition, there were reports of a possible increase in Guillain–Barré syndrome, a rare neurological condition, among those recently vaccinated. Among the 532 patients who developed the disease, 25 of them died. The vaccination program, which was not well-organized, was soon closed down. Fewer than 20% of the U.S. population received the swine flu vaccine as part of this national program.

The number of deaths possibly associated with the vaccine far outweighed any deaths caused by swine flu, itself. There were 13 hospitalizations related to the swine flu, and one reported death (Fisher, 2020). Swine flu was ridiculed as a cure without a disease (Young, 2020). Although Ford's pardon of President Nixon probably contributed more to his defeat by Jimmy Carter, his handling of the swine flu outbreak, while done in good faith, may have done more harm than good, according to some commentators. Vaccines against swine flu have shown some delayed benefits. McCullers et al. (2010) found that people who had received it had a more significant immune response to the 2008–09 H1N1 seasonal influenza virus.

Herd Immunity

Early in the COVID-19 pandemic, governmental leaders discussed the concept of herd immunity as a possible strategy for containing the virus. Mayor de Blasio of New York, for example, relied upon the advice of Mitchell Katz, the head of the city's healthcare system. Katz advised the Mayor that more than 99% of those infected with COVID-19 would completely recover. As a result, their immunity would protect them and the few non-immune individuals (Wright, 2021). Katz seemed to view COVID-19 as a mild condition—particularly among those under age 50 (Wright, 2021). De Blasio's stance on keeping schools open despite students becoming ill appeared to be influenced by Katz's herd immunity approach to reducing COVID-19 cases (Wright, 2021).

The term "herd immunity" originates in veterinary medicine (Lombard et al., 2007). Farmers, often without understanding the mechanism involved, frequently used fluid from sick animals to protect their entire herd. In the 1920s, the pathologist Sheldon Dudley, influenced by animal research on group immunity and measles transmission among boys in a residential school (Jones & Helmreich, 2020), revealed that exposure to measles led to protective immunity. Dudley found that measles could still be transmitted when 70% of students in a classroom are immune, but 83% of students must be resistant to prevent further transmission. After multiple years, however, a cohort of susceptible children would emerge.

It was often reported that reaching herd immunity was the key to successfully reducing the incidence of COVID-19. Projections and prevalence data about the percentage of the population needing to develop antibodies was a factor in removing some social distancing requirements. When herd immunity is sufficiently high in a population, it can protect susceptible individuals indirectly from infection. A sufficient number of individuals within a population must have developed antibodies to achieve herd immunity. At a certain point, the number of those susceptible will fall below the level required for transmission. As a result of many people developing immunity, a numerical figure known as the herd immunity threshold is reached. Herd immunity is an important protective factor for immunocompromised adults for whom the COVID-19 vaccine may be contraindicated or very young children for whom a vaccine may not have been approved.

When herd immunity is achieved, susceptible individuals are protected, and the condition is no longer considered a public health threat. The estimated herd immunity threshold for COVID-19 has varied from 70% to 90%. There are two basic ways to establish individual immunity—vaccination or natural immunization of most of the population (Randall and Barreiro, 2020). This “natural” approach has the risk of causing a large number of fatalities, despite the development of population immunity.

Several factors determine herd immunity. Probably the most critical variable is the reproductive number, typically written as the symbol “R_0” (pronounced as “R-naught”). R_0 is the average number of infectious cases associated with a single infectious individual. While influenced by multiple factors, the median R_0 value of the “ancestral strain” (Liu & Rocklöv, 2021) of the virus associated with the initial pandemic outbreak is 2.79 (Liu et al., 2020)—meaning that a single infected individual will infect approximately three persons. Randoph and Barreiro (2020), using a reproductive number of 3, report that the corresponding herd immunity would be 67%. The more recent delta variant of COVID-19 has greater transmissibility with an R_0 of 5.08 (Liu & Rocklöv, 2021).

In comparison, the reproductive numbers for measles are between 12 and 18, 6 and 7 for Diptheria, 1 and 2 for Ebola, and 1.3 and 1.7 for Influenza H1N1. The high transmissibility of measles is a significant factor contributing to public health concerns about outbreaks because of low vaccination rates. When considering herd immunity, it is essential to recognize that reproductive numbers assume a static state leading to lifelong immunity. Reproductive numbers may need to be modified to account for possible viral mutations and vaccine effectiveness changes. Immunity is temporally limited for some infectious diseases, including influenza and pertussis, and periodic outbreaks do occur. This time-limited effectiveness may be the case for COVID-19 vaccines.

Another index, $R_{a,}$ refers to the average number of secondary cases generated by a single index case in a partially immune population. As such, R_a will be influenced by the population’s immune state, which, in turn, will be impacted by vaccination rates and once-infected individuals who survived and produced antibodies. Concerning COVID-19, secondary attack rates depend on the setting and have varied widely from 4.6% to 49.56% (Shah et al., 2020). A recent meta-analysis placed COVID-19‘s overall secondary attack rate at 17%, with 28% for persons in the same household (Tian & Huo, 2020).

Superspreader events feature a disproportionate number of secondary infections associated with a limited number of index cases. The rate of infection exceeds the reproductive number. Some individuals appear to have a more contagious form of the illness and shed the virus (capable of transmission) for a more extended period of time (Majra et al., 2021). Lin et al. (2020) describe a case of a COVID-positive individual infecting 28 people in Ningbo, China. Environmental factors also play a role, including ventilation and the social density of the setting (Majra et al., 2021). COVID-19 superspreader events internationally have occurred in religious settings, schools, food processing plants, and shopping venues. Affected countries have included Singapore, France, Ghana, New Zealand, and the Netherlands (Majra et al., 2021). One of the most publicized superspreader events was the White House Rose Garden ceremony in which President Trump introduced Amy Coney Barrett, his nominee for Supreme Court Justice. Eleven of those in attendance tested positive for COVID-19 (including President Trump). Masks nor social distancing were in evidence at the event (Wright, 2021).

Other factors are likely to play a role in COVID-19 transmission. There are a growing number of reports of fully vaccinated individuals developing the infection. It has been found that COVID-19 antibodies may be present a year after infection, but they may not be sufficient to prevent reinfection (Randolph & Barreiro, 2020).

Finally, another factor determining herd immunity is the proportion of those infected with a disease that survive. The case fatality rate refers to the number of deaths attributable to a specific disease. For COVID-19, this figure has changed significantly since the pandemic‘s onset.

An early report from China, based on 41 persons testing positive, reported a 15% case fatality rate (Huang et al., 2020; Randolph & Barreiro, 2020). However, a subsequent report based on a much larger Chinese sample indicated a rate of 1.36% (Randolph & Barreiro, 2020). A comparable rate of 0.99% (7 deaths) was reported for the 3711 passengers and crew of the Diamond Princess cruise ship. It is essential to recognize that the COVID-19 case fatality rate will vary due to multiple factors, including comorbid medical conditions, age, and access to health care (Randolph & Barreiro, 2020). In comparison to other infectious disease outbreaks, COVID-19 death rates are lower than for SARS (9.5%) but higher than for influenza (0.1%) (Onder et al., 2020). Overall, COVID-19 case fatality rates have been declining since 2020. The unadjusted COVID-19 case fatality rates for the United States were 5.77%, for South Korea, 2.33%, and for Italy, 13.7% (Onder et al., 2020). Again, issues such as the availability of health care and access to COVID-19-specific medical interventions (e.g., ventilators) likely play a role in international differences.

Given the factors involved, the best long term population outcome for COVID-19 is probably reduced prevalence. In the general population, COVID-19 is likely to persist at a low level endemically. Evidence to date suggests that human movement, such as migration and air travel, contributes to actively symptomatic and infectious individuals visiting regions with less population immunity, making complete eradication unlikely.

Herd Immunity as a COVID-19 Intervention Strategy

Britain’s Consideration of Herd Immunity

As suggested above, politicians in several countries indicated that developing herd immunity “naturally” was the best approach to addressing the COVID-19 pandemic. There were transient suggestions that the U.S. government might address the COVID pandemic through the development of herd immunity. However, despite considerable debate—particularly between Drs. Bix and Atlas—the strategy did not prevail (Jones & Helmreich, 2020; Wright, 2021). Recent information suggests that Britain’s government seriously considered a deliberate herd immunity strategy to address the pandemic. Like Trump, Bolsonaro, and Orban, British Prime Minister

Boris Johnson initially responded to early information about COVID-19 by denying its significance and refusing to take precautionary measures. In a March 2020 press conference, Prime Minister Johnson stated, "I was at the hospital the other night where I think there were a few coronavirus patients, and I shook hands with everybody" (Johnson cited in Morgan, 2020). In February 2021, to minimize COVID-19's impact, the British Health Ministry instructed the NHS' suppliers to maintain their current quota of medical supplies rather than order more. The Ministry also instructed hospital staff to reuse masks and other personal protective equipment (Lee, 2020).

Like other populist leaders, Johnson's cavalier approach to COVID-19 was likely influenced by economic and political issues. December 2020 marked the end of the period when Great Britain was to leave the European Union (EU) Johnson had been a major supporter of Brexit, which would allow Britons "to take back their destiny." Many Britons were surprised at the referendum's outcome on leaving the E.U. and were encouraging politicians to reconsider. Johnson had linked leaving the E.U. to better health care for England (McKee et al., 2020; McKee & Stuckler, 2020). He indicated that with the money saved from supporting the E.U., the National Health Service could build 40 new hospitals (McKee et al, 2020; McKee & Stuckler, 2020). Johnson had even invoked some conspiracy theories indicating that forces such as the "deep state" would work to bring Britain back into the E.U. Johnson, politically, needed to show that the British economy was strong in the absence of E.U. membership. The arrival of COVID-19 threatened this goal.

In March 2020, Graham Medley, one of Johnson's COVID advisors, publicly stated, "We are going to have to generate what we call 'herd immunity,' which would require a nice big epidemic" (Morgan, 2020, p. 810). In early March, Patrick Vallance, Johnson's Chief Medical Advisor, was also touting the herd immunity strategy: "it's not possible stopping everyone in the population from getting it. And it's actually not desirable because you want some immunity in the population" (Morgan, 2020, p. 285). With this advice, Johnson packaged herd immunity as "following the science": "…one of the theories is that perhaps you could take it on the chin, take it all in one go and allow the disease, as it were, to move through the population, without taking draconian measures" (Morgan, 2020).

However, an approach to immunity developed originally with domestic animals did not sit well with some Britons: "…treating people like farm animals…to be domesticated and culled" (Jones & Helmreich, 2020, p. 811). Furthermore, the matter-of-fact description of the number of deaths required to achieve herd immunity was seen as dehumanizing (Jones & Helmreich, 2020). To some of the British public, the herd immunity strategy suggested a form of social engineering with eugenic overtones.

A public letter signed by a group of 500 U.K. scientists and 40 international experts indicated that following the herd immunity approach would result in approximately 250,000 deaths unless more restrictive measures were implemented (Morgan, 2020). In addition, the National Health Service did not have the capacity to respond to the number of seriously ill patients if herd immunity was the primary strategy. On March 12, Johnson seemed to face the harsh reality of the pandemic, saying, “I must level with the British public; many more families are going to lose loved ones before their time” (Morgan, 2020, pp. 289–290). By mid-March, the government’s health officials changed course and publicly stated that herd immunity was no longer the plan. Instead, COVID-19 containment would occur with testing, contact tracing, and distancing measures, including school closings (Morgan, 2020). However, the lost time in pursuing the new strategy may have accounted for the United Kingdom having the highest number of COVID-19 deaths of any European country.

Sweden’s Herd Immunity Strategy

Sweden centered their national response to COVID-19 on herd immunity. The Swedish approach was based on the “Great Barrington Declaration” (Banerjee, 2021), which argued that herd immunity would develop if infections were allowed to spread in a “controlled” way. Swedish primary schools remained open, and no limits were placed on the number of passengers on public transport or shopping centers. Initially, mass gatherings were confined to not more than 500 people, but several weeks later, restricted to 50 people. The public guidelines regarding social distancing were voluntary. Some Swedish commentators suggested that it was unconstitutional to limit individual freedom of movement (Brussalelers et al., 2022; Sörensen, 2020). The number of fatalities became apparent in the first months of the pandemic, with Sweden among the top 10 countries internationally in COVID-19 deaths per 100,000 population. Neighboring countries closed their borders to Sweden in June 2020. The government recommended facemasks in hospitals and care homes but only when interacting with patients with confirmed or suspected COVID-19. The government discouraged wearing facemasks among the general public. While secondary schools were closed for several months and universities went to online instruction, primary schools remained open. Keeping the schools open, it was argued, was appropriate since children would not be strongly affected by the virus. Schools were touted as an optimal setting for establishing herd immunity. Parents who kept their children home from school because of their risk for COVID-19 could be fined and/or reported to child protective services for educational neglect (Brusselaers et al., 2022). Children were forbidden to wear face masks at school.

The government’s epidemiologist declared that there was no reason to know how many people were infected, so testing was not encouraged. Several scholarly papers describe a profound lack of government transparency around COVID-19 (Brusselaers et al., 2022). The governmental public health agency discouraged facemask wearing by the public and suggested that it might even be associated with injury and would generate unnecessary fear among Sweden’s citizens (Brusselaers et al., 2022). Schools did not inform parents of cases of COVID transmission in the classrooms. Some schools instructed parents not to tell their children if they had the virus to avoid spreading fear (Brusselaers et al., 2022).

While Europe has been praised for its social solidarity value, this principle's influence may be waning. In Sweden, there were xenophobic elements in the government's explanations of concentrations of COVID cases. The government's public health agency argued that the high number of cases in nursing homes was attributable to staff who did not adequately speak Swedish. In addition, the large immigrant population was accused as being a significant source of the high rate of cases in Sweden: "The main message seems that those who are more vulnerable are not going to be protected by the state (since they should take their own measures and isolate). The rest of the population should live their lives relatively uninterrupted" (Brusselaers et al., 2022).

Swedish exceptionalism was an ongoing theme in the government's public announcement about the country's health status. Sweden was portrayed as the only country with the "correct" COVID-19 strategy. Other countries were simply wrong. The Swedish Public Health Agency, while not open about many aspects of the pandemic, did not welcome information from outside experts. Epidemiologists who were well recognized in the scientific community were subjected to governmental ridicule in the news media. Governmental spokespersons labeled these scientists incompetent, "hobby epidemiologists." Some critics called the absence of transparency, dismissal of scientific evidence, and lack of government accountability a form of "Sovietization" (Sorenson, 2020). At the end of 2020, Sweden's COVID-19 death rates were 4–5 times greater than for neighboring countries (Claeson & Hanson, 2021).

Over 2 years after COVID-19's onset, the results of the Swedish strategy are mixed. In 2021, Sweden had one of the lowest overall excess mortality rates in Europe at approximately 5%. The decision to keep primary schools open also appeared to have benefits. The incidence of severe COVID-19 among school-aged children was low. Based on reading skills tests among Swedish children in the first through third grades, there was no evidence of a decline in test scores during the pandemic. Arguing that keeping primary schools open during the pandemic prevented the learning loss reported in other countries, Hallin et al. (2022) also reported that socioeconomic status did not influence the results—in contrast to a pattern seen in other countries.

Brazil's Ambivalent Herd Immunity Strategy

Brazil has government-funded health care for nearly 80% of its population. As is often the case with universal systems, the population has a very high vaccination rate, with 96% vaccinated against polio, diphtheria, and hepatitis (Malta et al., 2021). However, in terms of COVID-19, Brazil's death rate has been exceptionally high. In May 2020, the state of Amazonas' death rate contributed to the "…collapse of both health care and funerary systems" (Malta et al., 2021, p. 1). President Bolsonaro was pursuing a herd immunity strategy while downplaying the significance of the pandemic. At one point, he scolded Brazilians for being "sissies"

(Malta et al., 2021, p. 1). Without a lockdown and with many Brazilians living in high-density favelas while working and attending school, conditions were optimal for COVID-19 transmission (Malta et al., 2021).

In October 2020, it was reported that Manaus, the capital of the state of Amazonas, had achieved herd immunity with a 75% vaccination rate. However, subsequent research suggested that the rate of acquired immunity was significantly less than initially reported. Moreover, Ferrante et al. (2021) report that the period of naturally acquired immunity is limited to 240 days. As a result, when the second wave of COVID-19 appeared in the region, there was a substantial increase in cases and deaths. In addition, the investigators noted that return to face-to-face school seemed to be a factor associated with the second wave of COVID incidents.

Aligned with President Bolsonaro, the governor of Amazonas publicized the success in reaching herd immunity. Under questioning from a congressional committee, the executive secretary of the Ministry of Health argued that population level lockdowns would work against the development of herd immunity. In particular, she noted that the schools were a setting where the virus could "naturally evolve" while not seriously harming the children. She suggested that re-opening face-to-face schooling was part of a herd immunity strategy (Ferrante et al., 2021).

Other Brazilian investigators in Manaus found that herd immunity had not yet been achieved even in regions with 76% of the population affected. High infection rates, by themselves, do not necessarily convey herd immunity. The infection mortality rate in Manaus, a relatively young population, was estimated to be between 0.17% and 0.28% (Ferrante et al., 2021). However, when deaths per 100,000 inhabitants were compared with similar figures for the United Kingdom, France, and the United States, rates were approximately twice as high in Manaus (Sridar & Gurdasani, 2021).

A Brief History of Anti-vaccination Movements

While COVID-19 drew public attention to vaccine reluctance, in many countries, particularly in the Global North, hesitation about vaccination was more common than previously believed. It is also a political flashpoint in several countries, including the United States and France. Two primary factors have contributed to contemporary vaccine reluctance. First, there has been an alleged (and effectively refuted) link between autism spectrum disorder and the MMR vaccine. The second is a philosophy among parents that immunity from disease exposure is safer and more "natural" than "artificially"manufactured vaccines. History suggests that these issues have a legacy dating back at least to the mid-nineteenth century when parents believed natural immunity was preferable to the "artificially" provided immunity of vaccines (Porter & Porter, 1988)—a view still present today (Kaastan, 2021).

In the 1800s, Alfred Russell Wallace, who developed Darwin's theory of evolution independently, yet historically, simultaneously with him, was one of the most prominent British anti-vaccinationists. Another early anti-vaccinationist was physician and immunologist Charles Creighton, who believed that diseases were caused by miasma (“bad air”). Lemuel Chadwick, a nineteenth-century English lawyer, was a prominent advocate of this perspective. Chadwick headed the Poor Law Commission and is considered one of the founding figures of the sanitary reform movement (Porter & Porter, 1988). Despite John Snow’s finding that cholera transmission appeared to occur via ingestion of contaminated water, the miasma theory was invoked to account for smallpox.

Creighton espoused a version of miasma and poor sanitation as the cause of smallpox. In Gloucester, where the anti-vaccination movement had solidly established itself, Creighton pointed out that smallpox was confined to the southern part of the city and was the result of “filthy sewers and drains” (Porter & Porter, 1988, p. 248). Creighton was also a harsh public critic of Jenner and the smallpox vaccine (Cook, 2000). Creighton asserted that the basis of the vaccine in animal matter led to a type of poisoning of the human system (Porter & Porter, 1988). In addition, he publicly criticized Jenner, suggesting that Jenner was “…little better than a criminal and a money grabber who had duped Parliament and the scientific and medical worlds into believing in his mystical message” (Porter & Porter, 1988, p. 237). There are suggestive parallels between Creighton’s anti-Jenner criticism and contemporary COVID-19 conspiracy theories that argue that the pharmaceutical industry created the disease to reap substantial profits from a vaccine (Islam et al., 2021).

The notion that certain diseases should run their course to provide natural immunity was supported by some U.S. clergy in the early 1900s. For example, following the Ancient Greek humeral theory, smallpox was believed to balance the body’s fluids and promote health. Additionally, clerics of the era and some today criticized vaccination as artificial interference with God’s plan, an idea propagated by some small churches in America (Allen, 2019; Porter & Porter, 1988).

Anti-public health movements were also present in the United States. For example, in the 1950s, during the Cold War, fluoride was added to the water supply to reduce tooth decay. However, there were concerns expressed that the movement for water fluoridation was a communist plot designed to reduce the cognitive ability of Americans (Cury et al., 2019).

Echoes of the moral and quasi-medical objections from the early days of smallpox vaccination were heard in the more recent controversy regarding the HPV vaccines. Because it is a sexually transmitted infection, the recommendation for HPV vaccination raised some strong objections. It was argued that the vaccine would encourage sexual activity among young adolescents. There was also concern about the spread of the erroneous belief that the vaccine was an effective means of contraception which it was not. Proposals to make the vaccine mandatory and required for school attendance raised concerns about parental rights. In examining YouTube videos about the HPV vaccine, over 50% were negative in tone (Briones et al., 2012). The most common theme in the videos viewed was that the vaccine was physically harmful. Half of the videos did not mention the association between HPV and cervical cancer. About 20% of the videos implied that the vaccine would become mandatory and violate parental rights to make choices for their children (Briones et al., 2012). Again echoing Dr. Creighton’s attacks on Jenner as excessively profiting from the smallpox virus, there were reports that because of economic issues and undue influence upon the FDA by companies making vaccines such as Gardasil, pharmaceutical manufacturers rushed the vaccine into use without adequate safety testing (Intlekofer et al., 2012). During the Republican presidential primary debates, Congresswoman Michelle Bachman told a story of a girl who had developed "mental retardation"from the vaccine (Intlekofer et al., 2012). No one was able to locate this alleged victim of the HPV vaccine.

In the 1970s and 1980s, many British parents did not have their children receive the pertussis vaccine. There had been reports in 1974 linking 46 cases of a neurological condition to the vaccine. The resulting decline in pertussis vaccinations among children (81% in 1974 to 31% in 1980) resulted in a significant outbreak of the condition (Hussain et al., 2018).

In 1998, Dr. Andrew Wakefield held a news conference outside London's Royal Free Hospital. Wakefield was promoting an article he had authored recently published in the prestigious journal *The Lancet*. Based on a small sample of 12 children, Wakefield concluded that the MMR vaccine caused autism. In the news conference, Wakefield argued that the triple shot combination triggered several conditions and could elicit autism spectrum disorder within a matter of days after being vaccinated. In the late 1990s, Wakefield argued that the triple shot should be broken up into separate measles, mumps, and rubella shots given separately at yearly intervals. After some investigation, it was found that Wakefield had been a consultant to attorneys who were litigating against vaccine manufacturers for malpractice. As the scrutiny became more intense, there were indications that Wakefield's data may have been fabricated. As a result, he was removed from the medical registry in the United Kingdom, effectively preventing him from practicing medicine there. He subsequently came to the United States, became a sought-after speaker internationally, and directed a film supporting the link between autism and vaccines.

Some commentators have placed the blame for vaccine reluctance on U.S. talk shows. Oprah Winfrey, for example, provided a televised platform for members of the anti-vaccination movement (Olpinski, 2012). Among those were TV personality and model Jenny McCarthy, who presented herself as an autism expert (Hussain et al., 2018) by writing the forward to one of Wakefield's books. Wakefield's publicized misinformation has been called one of the most damaging medical "hoaxes" (Hussain et al., 2018) of the past century. There is considerable evidence that the Wakefield misinformation has contributed to measles outbreaks and reduced COVID-19 vaccine uptake.

Despite the publicized retraction of Wakefield's article, belief in vaccine harm rose significantly. In the United Kingdom, vaccination rates were as low as 61% in some parts of London (Hussain et al., 2018). The Wakefield article was associated with a measles resurgence in many parts of the world where it had been eradicated. Because measles is highly contagious, herd immunity requires that 96–99% of the population be vaccinated (Hussain et al., 2018). Relatively small reductions in measles vaccine uptake can have significant consequences. For example, in 2014–15, 125 people contracted measles in an outbreak reported having begun at California's Disneyland. Those who developed measles included infants who had not reached the age for vaccination.

Several factors contributed to the Disneyland measles outbreak, the 23 U.S. measles outbreaks, and more than 600 cases during 2014 (Halsey & Salmon, 2015). Air travel can bring unvaccinated persons into contact with those with active illness within hours. By 2015, Europe reported 10,000 cases of measles in recent years. Many European school systems did not require standard childhood vaccinations for attendance (Halsey & Salmon, 2015). In addition, there appeared to be an increase in "philosophical" and religious requests for vaccine exemptions, which many physicians in states such as California provided. As a result, because of growing vaccine hesitancy among parents, it was estimated that measles vaccination rates in the Disneyland area may have been unusually low at that time. With a law that went into effect in 2014, California tightened the criteria for these exemptions (Gottlieb, 2016). States with more restrictive laws, such as only allowing exemptions for medical reasons, tend to have higher vaccination rates (Gottlieb, 2016).

Changes in the Social Context of Health Care

Vaccine hesitancy occurred simultaneously with changes in the public's interactions with the healthcare system. In parts of Europe and North America, as the pandemic struck, medicine was moving toward a more collaborative physician–patient relationship model (Epstein et al., 2010) rather than one rooted in unilateral physician authority. A feature of patient-centered was the value that patients be given options regarding treatment. Through discussion with their healthcare provider, patients would select the therapy most consistent with their values and lifestyle (Keirns & Goold, 2009). Physicians who directed patients to take specific actions were criticized as condescending and paternalistic (Rodriguez-Osorio & Dominguez-Cherit, 2008). However, with this newly acquired autonomy, patients may not consider evidence-based appropriate recommendations such as COVID vaccination. In addition, they may not appreciate the consequences of refusing healthcare professionals' advice.

The public's direct access to specialized medical information, formerly the province of healthcare providers alone, rose exponentially with Internet saturation. In addition, pharmaceutical marketing directly to patients also contributed to requests for specific treatments (Searight, 2019). Studies of common Internet sites, such as Facebook, Twitter, and YouTube, find that approximately 40% of the vaccination information on these platforms is negative. For example, a 2007 study of YouTube videos found that the anti-vaccination presentations had more views and higher ratings than those supporting vaccination (Keelan et al., 2007; Hussain et al., 2018). In addition, research before COVID-19 found that 10 min spent on an anti-vaccination website led parents to have more negative views of vaccines—an effect that was still present 5 months later (Downs et al., 2010).

When COVID-19 struck, the United States and other world governments, including Russia, China, and France, devoted considerable resources to highly publicized efforts to develop a vaccine for the condition. In the United States, this effort was named Project Warp Speed (Moore & Klasse, 2020). However, it is essential to recognize that this vaccine development and accompanying publicity was occurring in the context of substantial preexisting vaccine hesitancy in the Global North. Vaccinations had also already become a political issue in some circles, often uniting conservative parents with those believing in a natural lifestyle and accompanying alternative homeopathic medicine.

Biomedicine and Scientific Research: A Loss of Public Trust

As discussed in Chap. 2, science, the foundation for modern medicine, has been under attack. In the United States, health care has become "corporate," with the number of physicians in independent practice rapidly shrinking. Instead, healthcare professionals have become employees of practices owned by large hospital corporations. This trend began in earnest in the 1990s. With control over individual health care by insurance conglomerates and the growing price of medications and medical equipment, there has been an overall loss of trust in healthcare (Searight, 2019). There has been increased concern that business and profit outweigh the best care for patients. This suspicion on the part of patients was particularly true during the 1990s with the emergence of managed care with complicated and obstructive referral processes. When a pandemic occurs, and public infection rates and death counts are released daily, it enhances one's sense of vulnerability and leads to self-protective hypervigilance. As Goldenberg (2021) notes, "…even if patients trust their physicians, they may not trust the medical system that their healthcare provider represents" (p. 115). Several COVID conspiracy theories discussed below reflect these themes. For example, it was suggested that hospitals make significantly more money for COVID-19 patients because of federal rules. As a result, patients with some of the non-specific symptoms of COVID were allegedly given COVID diagnoses without being formally tested to reap the financial benefits. COVID deniers suggested that this economic incentive led to inflated prevalence rates.

Discrediting science has become a significant theme among COVID deniers, conspiracy theorists, and anti-vaccination groups. In some respects, post-modernist philosophy and problems with consistent validation of research findings are likely contributing factors. In the past, such as with the announcement of the polio vaccine, governments have presented science as politically neutral. Britain's Prime Minister Boris Johnson invoked "following the science" when suggesting herd immunity as a COVID intervention strategy. While not directly referenced by the anti-vaccine community, they might find companionship among philosophers of science who have long contended that science is not value-neutral. Thomas Kuhn famously described how values and their social context support certain types of scientific activity and findings.

One approach that would seem logically acceptable to address the vaccine controversy would be to rely upon the evidence. In most applied fields, education, mental health, medicine, and even public policy, evidence-based guidelines are now guiding practice. However, philosophers of science suggest that the evidence may not be value-neutral (Goldenberg, 2021).

In his classic work, *The Structure of Scientific Revolutions*, Kuhn observed, "Whatever scientific progress may be, we must account for it by examining the nature of the scientific group, discovering what it values, what it tolerates, and what it disdains …" (Kuhn, 1970, p. 468; cited in Urry, 1973, p. 468). Invoking Kuhn, Goldenberg (2021), in her analysis of current vaccine science, notes, "While scientific claims *can* be held to epistemic standards like empirical adequacy, the assumptions values, and interests that go into, say, designing the experiment or interpreting the data ensure that science cannot be value free" (p. 96).

The boundaries between specialized science and the public have become much more permeable. For example, the New York Times, National Public Radio, and numerous news magazines have reported on the replication crisis in psychology and other disciplines. Likewise, the financial relationship that major medical journals have had in the past with for-profit pharmaceutical corporations (Smith, 2003) has been described in the popular press.

The Influence of Dubious Experts

A further complication for the general public deliberating about receiving the COVID-19 vaccine are biomedical scientists and physicians who publicly espouse anti-vaccination claims.

By July 2020, President Trump had turned against the health expertise of the Centers for Disease Control and Dr. Anthony Fauci with several public criticisms, including accusing the CDC of lying about the number of COVID-19 cases. Trump's administration developed affiliations with "alternative experts." Data about COVID-19 prevalence were no longer released to the CDC but to a healthcare organization that would send it to the White House (Wright, 2021). At about this time, President Trump publicly dismissed Anthony Fauci as "…a nice man, but he's made a lot of mistakes." The administration's trade advisor, Peter Navarro, said Fauci "was wrong about everything"(Rogers, 2020). (Navarro, with a Ph.D. in economics, seemed to establish himself as an expert in infectious disease—"I am a social scientist, I have a Ph.D. And I understand how to read statistical studies, whether it's in medicine, the law, economics or whatever") (Hemmer, 2020). After severing the Trump administration's ties with the Centers for Disease Control and Dr. Fauci, Dr. Scott Atlas, a neuro-radiologist and a periodic Fox News commentator, became one of the Trump administration's public voices on the pandemic (Wright, 2021). Without advanced training and education in epidemiology, Atlas was a physician and fellow at Stanford University's Hoover institution (Wright, 2021). In a modified herd immunity approach, Atlas argued that only very high-risk population segments, such as the elderly, should be vaccinated (Editorial Board—Washington Post, 2022). Atlas projected approximately 10,000 COVID deaths—a substantial underestimate of the one million Americans who died from the infection (Editorial Board—Washington Post, 2022).

The United States was not alone in having questionable experts providing COVID-19 vaccine guidance to the general public. Polish citizens within the country and abroad have among the lowest COVID-19 vaccination rates in the E.U. A survey of Polish residents in 2021 found that only one-third of adults planned on receiving the vaccine. Public distrust of government appears to be a significant factor in these vaccination rates. A theme in Polish populism is that scientists and physicians opposing vaccines are independent of the professional "status quo," who are portrayed as self-serving rather than benefiting "the people" (Żuk & Żuk, 2020). Among the independent scientists is Maria Czajkowska-Majewska, a neuroscientist who has argued that vaccines contain heavy metals and lead to reductions in intelligence. She has been quoted saying that vaccines "… are the biggest mistake of medicine" (Żuk & Żuk, 2020, p. 797). Another Polish vaccination critic, Urszula Krupa, a European Parliament member and an anesthesiologist, argued that the damage to health from vaccines outweighs any benefits. She suggests that vaccines may lead to "carcinogenic complications" (Żuk & Żuk, 2020, p. 707).

In Italy, a 2018 conference in Rome commemorating the 50th anniversary of Italy's National Order of Biologists became the source of considerable controversy when several anti-vaccination presenters were scheduled to speak. These scientists included Yehuda Schoenfeld, an Israeli immunologist, who has promulgated the view that vaccines have significantly contributed to the increase in autoimmune diseases. Another scheduled speaker was Luc Montagnier, a Nobel Prize–winning virologist who suggested that antibiotics could cure autism (Paterlini, 2018). Before his death in 2022, Montagnier asserted that COVID vaccines, rather than offering protection from the illness, were responsible for creating new viral variants (Apetrei et al., 2022).

To the general public, dubious experts suggest a significant division within the scientific community. When these COVID-19 "authorities" become affiliated with governmental leaders or present their work at scientific conferences, it enhances their perceived legitimacy. This presentation of disagreement about COVID vaccination among physicians and researchers is a valuable tool for those promulgating the anti-vaccine viewpoint (McKee & Stuckler, 2020).

COVID-19: Who Is and Is Not Vaccinated?

As of August 15, 2022, 69.5% of the world's population had received at least one dose of the COVID-19 vaccine (Holder–New York Times, 2022). Countries with high COVID-19 vaccination rates include Brunei, the United Arab Emirates, and Samoa at or above 99%. Cuba's rate is 94%, while the United States' vaccination rate is 79%, with Fiji at 80% and Sri Lanka at 78% (Holder, 2022). Citizens of countries least likely to be vaccinated are in Sub-Saharan Africa. These countries include Somalia at 18%, the Republic of the Congo at 13%, and Burundi at 0.2%. However, several countries outside of Africa have similarly low rates, such as Haiti at 2.2%, Yemen at 2.4%, and Papa New Guinea at 3.9%. While not a perfect association, there is a positive relationship between a country's (GDP) growth and the percentage of the population vaccinated for COVID-19 (Suarez-Alvarez & Lopez-Menendez, 2022).

Even before the pandemic, the World Health Organization had indicated that vaccine hesitancy was a major global threat (Khubchandani et al., 2021). Moreover, before the pandemic, surveys suggested that 20–30% of those in Global North countries were hesitant regarding vaccinations (Liu & Rocklöv, 2021).

Recent research on COVID-19 vaccination indicated that many of these reasons for vaccine hesitancy for the MMR and HPV vaccines apply to COVID vaccine reluctance. As of this writing (August 2022), data are still incomplete on the demographics of COVID-19 vaccine recipients. It also should be remembered that early vaccination efforts were often targeted toward specific subpopulations such as older adults and healthcare workers. By gender, while research findings show some inconsistency, a meta-analysis suggested that men were more likely to report the intent to receive a COVID-19 vaccination (Zintel et al., 2022). However, during the first month that vaccinations were available in the United States, 63% of those vaccinated were women, and 37% were men (Painter et al., 2021). While the difference was slight, several studies found male healthcare workers in the United Kingdom were slightly more likely to be vaccinated than women. However, a survey of hospital personnel in the United States found a more significant vaccination difference between men (79%) and women (69%) (Zintel et al., 2022).

By race/ethnicity in the United States, Asian-Americans were more likely to report the intention to be vaccinated during the first wave (Malik et al., 2020). By comparison, in the United Kingdom, Black, South Asian, Middle Eastern, and East Asian survey participants reported greater hesitancy about vaccination than Whites. However, actual uptake was more equitably distributed across ethnic/racial groups. For example, compared with Blacks in the United Kingdom, U.S. Blacks were less likely to have received the vaccine (Nguyen et al., 2022). However, some of this difference may be attributed to differences in access to health care, which is more strongly influenced by income in the United States. Nevertheless, when comparing Blacks in the United States with Blacks in the United Kingdom, these findings do suggest that there may be demographic and national differences in self-reported hesitancy and vaccine uptake.

A racial vaccination disparity in the United States was also present among frontline healthcare workers, with Black workers less likely to be vaccinated than Whites (Nguyen et al., 2022).

In the United States, education and income levels were associated with more positive responses to vaccination (Malik et al., 2020). Those who had completed college reported being more likely to accept the COVID-19 vaccine (Malik et al., 2020). Compared with unemployed individuals, those who were currently employed or retired were more likely to report the intention to be vaccinated (Malik et al., 2020). As of January 2022, vaccination rates were significantly lower in U.S. rural versus urban areas. COVID-19 incidence and mortality rates were also higher in rural areas (Saelee et al., 2022).

Reasons for Refusing COVID-19 Vaccination

Vaccine Quality

Concerns were expressed in European countries and the United States about how the rush to develop and make the vaccine available might adversely affect quality. In the United States, those who believed that President Trump was rushing the COVID vaccine to win reelection were more likely to be vaccine resistant. This resistance was true for both Republicans and Democrats (Palm et al., 2021).

Another issue impacting uptake is the vaccine's perceived effectiveness. This concern may have also been further supported by later emerging findings that the vaccine's protection was time-limited and that additional booster shots would be needed. This issue was associated with COVID vaccine hesitancy by 6% of French and 11% of UK residents surveyed (Steinert et al., 2022). A study conducted in Indonesia found that over 90% of those surveyed would like to be vaccinated if the vaccine had a 95% efficacy. Still, this figure dropped to 67% if hypothetical efficacy was only 50%.

Internationally, when asked if they would undergo vaccination if required by their employer and the vaccine's safety was guaranteed, there was considerable variation—83.7% in China assented. In comparison, fewer than 60% of Russians would agree to undergo vaccination under those conditions. Message framing also may exert a significant effect. When the safety and efficacy of immunization are mentioned along with a statement that most Americans will accept the vaccine, hesitancy is reduced. Overall, data from multiple countries suggest that more people have received the COVID vaccine than those reporting pre-vaccination reluctance (Zintel et al., 2022).

In the United States, the COVID-19 vaccine has recently been made available to children ages 6 months to 4 years. Many parents voice hesitancy about having their young children vaccinated. Among parents of young children, 40% of those surveyed indicated they would "definitely not" have their child vaccinated for COVID-19 (Lopes et al., 2022). Parents who politically identify as Republicans are significantly less likely to have their children vaccinated. Concerns expressed include unknown long-term effects and the newness of the vaccine. A slight majority of parents of these young children (53%) report that the vaccine poses a greater risk to their child's health than their child being infected with COVID-19. When examining this issue by political affiliation, 73% of Republican and Republican-leaning parents endorsed the view that the vaccine posed a greater risk than the illness (Lopes et al., 2022).

The Importance of Group Affiliation

One of the well-established models for predicting health behavior is the Theory of Reasoned Action (TRA; Fishbein & Azjen, 1981). In addition to attitudes toward a specific health behavior, subjective norms are a particularly salient TRA dimension.

In pre-COVID-19 vaccine studies, one of the most salient predictors of receiving the HPV vaccine was whether others in one's social network were planning to or had received the vaccination. Social and political group identification also plays a role in vaccine hesitancy. In the United States, political conservatives demonstrate a higher level of vaccine hesitancy than liberals. Additionally, Republicans are more likely to endorse a causal link between childhood vaccinations and autism (Motta, 2021) and hold negative views of scientists. Adherence to conspiracy theories is associated with strong group identification with like-minded persons (Akther & Nur, 2022).

To explain the importance of group affiliation in regards to vaccination, Goldenberg (2021) invokes social psychologist Leon Festinger's naturalistic study of cognitive dissonance (Festinger et al. 2017). In the book, *When Prophecy Fails*, Festinger et al. (2017) describe a faith-based group centering around Dorothy Martin, who indicates that she has been contacted by the "Space Brothers," who reveal a precise date for the world's destruction. However, a flying saucer will save those who believe before destroying the earth. Martin is a persuasive prophet and garners a following of believers. Members went to great lengths to demonstrate their faith, such as quitting their jobs, breaking off other relationships, and selling their homes. Despite repeated disconfirming evidence, Martin's group remained-steadfast in their belief. After revised dates in which the flying saucer failed to materialize, most members accepted the changes and remained part of the cult.

Eventually, Martin received a message that the world would be spared because of the group's great faith. Festinger et al. (2017) highlight the process by which members remain believers despite the predicted events never occurring. Like many contemporary conspiracy groups, membership in this group possessing a distinctive and unique insight not shared by outgroup members, became a defining feature of individual identity. QAnon, an organization strongly supportive of President Trump, and who shares many values of populist political ideology (Morelock & Narita, 2022), has also been critical of vaccinations. The organization, becoming international, has promulgated multiple COVID-19 conspiracy theories, including the virus as a bio-weapon. QAnon is a loosely organized movement that proves attractive to persons not feeling connected to society. The community provides a sense of being with like-minded people who may experience a lack of control over their lives. In addition, the conspiracy themes offer the security and status of specialized knowledge that outsiders (the elite, the deep state) lack (Lonnquist, 2020). Motta's (2021) study of vaccination attitudes in the United States concluded that being an "anti-vaxxer" provides a meaningful social connection and an accompanying identity. Goldenberg (2021) notes that being part of a social group that centers around conspiracies and being able to see hidden messages that others do not becomes a central part of one's identity. Dissuading someone from these beliefs threatens the foundation of the adherent's sense of self. Goldenberg (2021) analogizes the Festinger study to the role contemporary anti-vaccination beliefs play in individual self-definition. With a strong identity supported by like-minded anti-vaccine believers, rational information, such as scientific evidence of the benefits of vaccines, is discredited to maintain cognitive consistency and neutralize threats to identity.

Reasons for Vaccine Reluctance

Vaccines Cause Direct Harm

At least a decade before the COVID-19 pandemic, the general public had significant concerns about vaccine harm. Despite being categorically debunked, Wakefield's highly publicized report of a link between vaccines and autism has been very influential. Research suggests that among those predisposed to see vaccines as harmful, even mentioning false information to refute misinformation may strengthen its perceived credibility (Goldenberg, 2021). In a 2009 survey of U.S. parents, while 90% indicated that vaccines protect children, over half of this sample also worried about serious adverse effects, and 25% indicated that vaccines could cause autism. Nearly 12% had opted out of at least one recommended vaccine (Freed et al., 2010).

In 2019, in Samoa, a significant measles outbreak was reported to be associated with the MMR vaccine. Within a 24-hour period, 243 cases were reported to local officials. Of the 87 measles-related deaths, nearly 90% were children aged 5 years and under (MacIntyre et al., 2020). As a result, the vaccination rate for Samoan children under 12 months dropped substantially from 75% in 2012 to 40% in 2018. While it was later determined that the vaccine had not been properly prepared and was contaminated, the events opened the door for local anti-vaccine adherents (Riesmeyer & Feemster, 2020). In addition, the claim that vaccines were associated with autism was publicized in Samoa through vaccination groups, along with statements that hospitals were using adulterated or expired vaccines (Riesmeyer & Feemster, 2020).

Residents of Poland have frequently been exposed to government-supported anti-vaccination messages (Żuk & Żuk, 2020). These presentations have included "experts" on television reporting the effectively refuted position that mercury in vaccines causes autism. Żuk & Żuk (2020) describe a television program that made some efforts to present both sides of the vaccine issue. However, the anti-vaccine position was implicitly favored. During this program, while a physician was explaining the importance of vaccination, the presentation ended with a voiceover, explaining that more should be done to show the harm created by vaccination (Żuk & Żuk, 2020).

In a recent study of eight European countries (Bulgaria, France, Germany, Italy, Poland, Spain, Sweden, and the United Kingdom) one of the most common reasons for COVID-19 vaccine hesitancy were vaccine side effects. In particular, persons with preexisting medical conditions and allergies were concerned about vaccines' adverse impact. Others expressed worries about the vaccine's potential for causing infertility or harming a pregnancy, and with mRNA vaccines, concerns about modifying one's genetic makeup (Steinert et al., 2022). In addition, a study in Middle Eastern countries, including Jordan and Kuwait, found that respondents who spent more time on social media were more likely to report a concern about the COVID vaccine's adverse effects on pregnancy (Sallam et al., 2021). Another less specific form of harm was the possibility that the vaccine would produce unknown adverse health effects in the future (Steinert et al., 2022).

COVID-19 Is a Business Strategy for the Pharmaceutical Industry

Ulterior, profit-driven motives of pharmaceutical companies manufacturing the COVID-19 vaccine are a frequent social media theme in Europe and the United States. In Sallam et al.'s (2021) study in Middle Eastern countries, nearly 60% of respondents expressed the view that the appearance of the COVID-19 pandemic was associated with pharmaceutical companies' business interests. This view was occasionally associated with a statement that COVID was not as severe as it was being presented (Steinert et al., 2022). A variation is that the pharmaceutical industry had developed the COVID-19 vaccine before the pandemic, and the illness was deliberately released to boost company profits (Grimes, 2021; Islam et al., 2021). In Poland, a false claim was that pharmaceutical companies' profit motives resulted in releasing expired or defective vaccines to an unsuspecting public. Polish websites also described the business collaboration between physicians and pharmaceutical companies, resulting in physicians failing to inform parents of possible vaccine-related harm (Żuk & Żuk, 2020). Several COVID-19 conspiracy sites suggested that Anthony Fauci had significant financial ties to vaccine manufacturers—a theme in Robert F Kennedy Jr's biographical exposé of Fauci (Kennedy, 2021).

Violations of Individual Liberty

A study of social media messages associated with the Disneyland 2014–15 measles outbreak found a surge in coincident anti-vaccination themes. Among California lawmakers and public health officials, the outbreak triggered a public discussion about limiting vaccine exemptions and no longer permitting "philosophical" objections. The antivaccination community responded with multiple social media posts about the government overstepping its boundaries and interfering with parental choices (Broniatkowski et al., 2020a). Research has found that individuals who exercise religious and/or philosophical exemptions are at greater risk of contracting infections (Clemmons et al., 2015; Wang et al., 2014). The personal freedom theme takes the anti-vaccination argument away from personal harm or scientific merit and into the realm of political values (Broniatkowski et al., 2020b). Related social media posts emphasize individual choice, and that mandatory immunizations threaten constitutionally protected religious freedom of expression.

In addition, while not attacking vaccines directly, placing an emphasis on mandated vaccinations as violations of individual rights, has the potential for anti-immunization activists to develop a larger sympathetic audience. A similar strategy was employed when U.S. states and municipalities were legislating anti-smoking ordinances. These policies included no smoking rules in public places and cigarette taxes. Since cigarette smokers constitute a minority of the population, opposition to these attempted restrictions required a larger contingent of supporters. By de-emphasizing smoking and highlighting the encroachment upon individual liberty, the cigarette industry could potentially have more support for opposing this restrictive legislation (Searight, 2019). In theory, this approach could create an alliance between smokers, the tobacco industry, civil libertarians, and those concerned with equal rights (Jacobson et al., 1993).

In former communist bloc countries of Eastern Europe, the personal liberty arguments against vaccination resonated with citizens who recalled the communist era. During this time, the government exerted considerable control over free speech and movement. One Polish citizen stated, "Cattle and people in the former Soviet bloc were forcibly vaccinated" (Żuk & Żuk, 2020).

In a study of vaccine hesitancy in Middle Eastern Arabic countries, over 80% of respondents said that it was unacceptable for governments to mandate vaccination (Sallam et al., 2021). Government mandates can backfire if perceived as heavy-handed control. In particular, penalties often trigger psychological reactance—anger-motivated independence in opposition to perceived restrictions (Sprengholz et al., 2022). An example is a response to French President Macron's requirement that citizens produce vaccination cards ("green passes") to enter restaurants and shops. Macron's proposal led to large street protests, and the government subsequently withdrew some of the restrictions. By contrast, incentives appear to be more beneficial. Ohio's "Vax a Million" lottery increased state vaccination rates by 1.5% (Barber & West, 2022).

Religious Objections to Vaccination

Most states in the United States permit exemption from vaccination for religious reasons. Persons from orthodox or conservative religious communities appear more likely to object to vaccination. However, the reasons for refusing vaccination vary from concerns about dietary laws to faith-based critiques of science and not interfering with God's natural order.

Some vaccines contain pork products in the form of stabilizing gelatin (Kalam, et al. 2021). Dietary guidelines, particularly the pork product ban, have been a concern in some Jewish and Muslim communities. A certified Halal vaccine would be a possible solution for this issue in the Muslim community (Kalam et al., 2021).

Among members of faith-based communities that are strongly pro-life, the development of some immunizations, such as the measles vaccine, with aborted fetal tissue has led to vaccine hesitancy. Among some Christian leaders in the United States, governmental vaccine mandates are considered theologically immoral since stem cells from aborted fetuses may have been used to culture the vaccine (Williams & O'Leary, 2019). This information is typically not included in informed consent documents for vaccination, and some religious leaders have decried this omission as government deception. Among some Orthodox Protestant Churches, such as those related to the Dutch Reform Church, the stem cell issue and history play a role. In the Netherlands, memories remain of a nineteenth-century smallpox vaccine associated with severe side effects (Ruijs et al. 2011). From a theological perspective, Orthodox Protestant Churches may also see vaccination as unnatural interference in God's plan. Ruijs et al. (2011) found that regions of the Netherlands with a higher percentage of Orthodox Protestant denominations had lower vaccination rates.

In the United States, conservative religiosity is associated with a greater suspicion of science and higher rates of vaccine hesitancy. Within the United States, Corcoran et al. (2021) surveyed persons who identified as "Christian Nationalists." While there are similarities between Evangelical Christians and Christian Nationalists, their theologies have distinctions. Corcoran et al. (2021) describe Christian Nationalism as guided by a view that the United States should be a Christian nation. God selected the United States explicitly and will lead America to success. Christian Nationalists support literal Biblical interpretation and are concerned about the United States' immoral climate (Corcoran et al., 2021). Other characteristics associated with Christian Nationalism are a lack of support for same-sex relationships, racial/ethnic diversity, and political conservatism (Corcoran et al., 2021). In terms of science, Christian Nationalists support creationism and view science with great skepticism. In addition, adherents express skepticism about vaccines and, in particular, believe that children are given too many vaccines. Concerning the COVID-19 vaccine, Corcoran et al. (2021) found that Christian Nationalists are less likely to view it as safe and less likely to either plan to or have been vaccinated.

Orthodox Jewish communities have had multiple publicized occurrences of vaccine-preventable illness, including measles outbreaks in New York, London, and Israel. For example, in 2018–19, there was a significant measles outbreak in Brooklyn, New York's Orthodox Jewish neighborhood. It was traced to visitors from Israel, which had over 3000 active measles cases at the time. In addition, the vaccination rates in the New York counties involved in the outbreak were 77% compared to 98% for schools in New York State (McDonald et al., 2019). In describing an episode in Tel Aviv, most cases were members of the ultra-Orthodox Jewish community. This religious community contains several features contributing to the transmission of infectious disease, including large families living in households and neighborhoods with high population density and frequent attendance at often crowded religious services (Salama et al., 2021) within these conservative Jewish neighborhoods (Kaastan, 2021).

Israel's Ultra-Orthodox Jewish communities are over-represented in the country's COVID-19 deaths, where 1% of those over age 60 have died of COVID-19 (Maital, 2021). Among the Ultra-Orthodox, large families are typical and desired. A rumor that the COVID-19 vaccine could adversely impact fertility is a possible contributor to lower vaccination rates among Ultra-Orthodox Jewish women (Dreyfus, 2021).

Kaastan (2021) describes how American fundamentalist Christian organizations targeted vaccination efforts to Orthodox Jews from North America who had resettled in Israel. Anti-vaccination activists have reportedly targeted Orthodox Jewish communities in the United States as well. While there does not appear to be an explicit prohibition on vaccination in the Orthodox and ultra-Orthodox communities, lower vaccine uptake seems to be common (Kaastan, 2021). In Israel, the antivaccination organization often framed anti-vaccine messages in a religious context. In one of their presentations, an anti-vaccine activist linked mandatory vaccination laws to the Nazi experiments conducted in the Auschwitz concentration camps (Kaastan, 2021).

Parents placed the threat of vaccine harm to their children in a faith-based framework. This perspective was joined by an emphasis in Jewish legal codes on parental responsibility to protect their children's health. The religious prescription to oversee a child's health became challenging when parents did not believe that governments were sharing all relevant information about vaccines' adverse effects. The visiting Christian activists emphasized "… non-vaccination as necessary to avoid a repetition of devastating collective trauma. Jews should 'never again' be forcibly subjected to harm by the body politic…" (Kaastan, 2021, p. 291). These presentations also included performances by children who had allegedly suffered harm from vaccinations.

Among some Orthodox mothers, natural immunity from infectious disease was seen as God-given. This perspective included elements of herd immunity. The development of natural antibodies was desirable. As one mother stated: "…what's wrong with chickenpox? … we would have chickenpox parties, me and my friends, and bring our kids together. I got measles, I got mumps, I got chickenpox. Why can't my children get those diseases? Why shouldn't they be allowed? It builds their immune systems for life. Vaccines don't cause lifelong immunity" (Kaastan, 2021, p. 288).

Finally, some religious authorities have taken a neutral stand on vaccination. For example, in Poland, Roman Catholicism is highly influential, with 90% of the population identifying with the Church. Ignatowski (2022) characterized the Polish Catholic Church's response to the pandemic as "ambivalent." While many religious authorities have encouraged COVID-19 vaccination, others left the decision up to individuals (Wanta, 2021). The head of the Polish Catholic Bishops Conference was highly critical of the government for limiting church attendance during the pandemic—calling it a governmental intrusion on religious life. Of note, the southern regions of the country where vaccination rates are lowest are those in which the Church is particularly influential (Ignatowski, 2022; Wanta, 2021).

Racism, Colonization, and Vaccination

Vaccine hesitancy stemming from histories of racism, overt discrimination, persecution, and societal neglect does not reflect conspiratorial thinking—this reluctance to receive immunizations is based on reality. Unfortunately, many of these historical elements are still present as structural inequalities.

As noted in earlier chapters, Black Americans have borne a disproportionate burden of COVID-19 hospitalizations and deaths in the United States. Surveys conducted in late 2020 and early 2021 found that one-third of Black adults indicated they would "definitely not" or "probably not" receive the COVID-19 vaccine

(Bogart et al., 2022). Access to health care and trust in healthcare providers and government institutions are all likely to contribute to this decision (Bogart et al., 2022): "Medical mistrust has been conceptualized as an understandable, rational, self-protective response to historical and ongoing structural and interpersonal discrimination and racism in healthcare, and lack of trustworthiness of healthcare systems and institutions in U.S. society" (Bogart et al., 2022, p. 600).

Recent focus groups with African-American communities in the United States have elicited several themes associated with vaccine hesitancy. One theme that has consistently arisen in previous research and discussions of COVID-19 vaccination is the legacy of the Tuskegee syphilis study. While many of the details may not be articulated, the legacy of deception by the U. S. Public Health Service and the fact that African-American men were subjects of an experiment to which they did not give informed consent is well known. For example, Bateman et al. (2022) found that every vaccine oriented focus group they led mentioned Tuskegee or the idea of conducting experiments on African-Americans. For example, one participant's response when explaining their reluctance to be vaccinated illustrates how the word "Tuskegee" is freighted with meaning: "Well, I have one phrase, the Tuskegee experiment" (Bateman et al., 2022, p. 5). In addition, the fear that the vaccine is an experimental treatment being given to unsuspecting citizens has a historical basis: "I don't think there would be anything that would encourage people from this area to be quote/unquote, guinea pigs. We've seen the history, what has happened" (Bateman et al., 2022, p. 5).

The theme of being an uninformed participant in a potentially dangerous experiment even occurs with routine medical care. For example, in Jacobs et al.'s (2006) study of African-American patients' trust in physicians, Tuskegee is again invoked: "…but it reminds me of the Tuskegee Institute where they messed around and made the brothers have the disease instead of treating them just to see how it was going to affect them. So maybe sometimes you go instead of getting treated they just want to see what it's going to do to you…" (Jacobs et al., 2006, pp. 645–46).

Additionally, as noted in Chap. 2, within the African-American community, White dominated institutions such as law enforcement and health care are often categorized together. Both are seen as potential threats to African-Americans' well-being. "Everything basically goes together (because Black people are) living in a place that allows the police to brutally kill your people. You see at the hospitals they're doing the same thing" (Dong et al., 2022, p. 9).

Among the Latinx community, distrust took a different form. A concern expressed by U.S. Latinx groups was that receipt of the vaccine would require them to provide personal information which could be used against them. Clinics providing the COVID vaccine were possible traps that had been deliberately laid for deportation: "For so many people. You're like a sitting duck. If you go to a particular place… They could think, 'If I go to that place, I will get the vaccine, but probably I will get something more like arrested or deported or something'" (Bateman et al., 2022, p. 6). An ongoing concern within the Latinx community has been that immigration officials, particularly in areas such as the American Southwest, perform regular sweeps of settings such as hospitals looking for illegal immigrants.

An ethnic/cultural minority more commonly found in Europe are the Roma; approximately 10–12 million Roma, with the majority living in central and eastern Europe have had a difficult history. The Roma have experienced a long history of oppression, including forced sterilization of Romani women between 1970 and 1990 in the Czech Republic and Slovakia (Amnesty International, 2015). Many Roma live in densely populated settlements without running water (Holt, 2021). Vaccine uptake has been very low in many Roma communities. For example, 9% of Roma in Hungary and 12% in Macedonia expressed a willingness to receive a COVID vaccination (Holt, 2021). The Roma's history of internment in Nazi concentration camps is particularly relevant today. In response to COVID-19, some countries, such as Slovakia, attempted to contain the virus by employing the army to seal off Roma settlements (Holt, 2021). In a study of Roma communities in Italy, structural factors, the legacy of the Holocaust, and negative experiences with governmental authorities were associated with vaccine reluctance. Similar government-enforced isolation of Roma settlements was reported in Italy. At one camp, a COVID-19 vaccination campaign coincided with an eviction effort. Since it was necessary to be vaccinated to access places of employment and public services such as transportation, some members of the Roma community felt coerced to receive the COVID-19 vaccine but later regretted having been immunized.

Within the U.S. Native American community, the history of the decimation of communities from smallpox in the 1700s is well known. Deliberate spread of smallpox to reduce the Native American population has been a controversial topic (Patterson & Runge, 2002). The vestige of the narrative of attempted extermination through the smallpox virus is likely to be a factor influencing response to the COVID-19 vaccine. While COVID-19 infections and fatality rates have been approximately twice that of Whites, there have been some tribal communities where vaccine uptake is high. For example, among the Blackfeet community in Montana, a 95% vaccination rate was reported (Silberner, 2021). In addition, successful vaccine campaigns within Native American communities also have heavily involved community leaders in the process (Silberner, 2021).

Among Canada's First Nations, vaccine reluctance is associated with mistrust of governmental authorities and histories of being uninformed participants in biomedical research (Mosby & Swidorovich, 2021). There has been a history of medical experimentation on Canada's indigenous people, including an experimental trial for tuberculosis among First Nations' infants in the 1930s and 1940s. It is also reported that several surgical procedures and experimental drug therapies were administered in Indian hospitals in the late 1940s and early 1950s. Forced sterilization of indigenous women in Saskatchewan (Mosby & Swidorovich, 2021) is another example of colonizers using medicine to attempt population reduction. Distrust of Canada's public health establishment was increased during the 2009 H1N1 outbreak. In one alarming incident, Manitoba First Nations communities received body bags from the federal government instead of antivirals (Mosby & Swidrovich, 2021). The history of Canada's residential schools continues to be an ongoing theme, as mass graves have recently been located on the grounds of these shuttered schools. As a result, governmental efforts to encourage First Nations communities to be vaccinated have had varying responses, and suspicion endures. When the first doses of COVID-19 vaccines arrived in his community, a First Nation elder's social media post received attention when he described Mistissini (his community) as being "experimental rats" for the COVID-19 vaccine (cited by Mosby & Swidrovich, 2021, p. E381).

Anti-vaccination Communication as a Tool for Sowing National Discord

Several social media studies suggest that vaccine harm has been a theme used by foreign countries to create national discord. For example, research conducted before the pandemic indicated that "bots"—online accounts that are set up and programmed to promote specific content and "trolls"—Internet users who intentionally misrepresent their identity (often intending to generate conflict), were spreading anti-vaccine messages (Broniatowski et al. 2018; Dyer, 2018). In addition, some online addresses have been identified as Russian troll accounts associated with the "Internet Research Agency," a source reportedly backed by the Russian government (Broniatowski et al., 2018). However, distinguishing between bots, trolls, cyborgs, and actual human users was often challenging.

In analyzing over 250 internet vaccine-related messages, 43% were pro-vaccine, 38% anti-vaccine, and 19% neutral (Broniatowski et al., 2018). However, upon closer examination, Broniatowski et al. (2018) found that Russian trolls and Twitter bots were posting material about vaccines at a higher rate than the average platform user. Russian media, including social media, have pushed anti-vaccination messages for some time. During 2014 and 2015, anti-vaccination messages designed to disrupt public health and create discord in the Global South were common. For example, in the Democratic Republic of the Congo, deliberate misinformation programs were spreading the message that foreign public health workers were the source of the Ebola virus leading to a number of them being killed. Russian online media have also directly accused the United States of spreading deadly diseases in Africa (Wilson & Wiysonge, 2020).

A communication strategy employed by these accounts involved providing both pro-and anti-vaccination arguments while communicating a bottom-line recommendation against vaccination. It was noted that the Twitter handle, #vaccinate the U.S." in addition to providing pro and anti-vaccination messages, related the vaccine controversy to political issues in the United States. A common approach was to "…use emotional appeals to freedom, democracy, and constitutional rights." For example, one message was, "at first, our government creates diseases, then it creates #vaccines, what next?!" (Broniatowski et al., 2018, p. 1381). This strategy was used for stories associated with the measles outbreak in Disneyland.

Wilson and Wysonge (2020) suggest that Russian agents used anti-vaccination disinformation to "…achieve specific strategic goals" (p. 6). Vaccine communication intended to sow division in the United States included themes related to racial issues and economic divisions (e.g., “apparently only the elite get clean #vaccines and what do we normal ppl get?”) (Broniatowski et al., 2018). Researchers have found an association between foreign online disinformation campaigns and reduced vaccination rates, which, in turn, serve to increase foreign deaths (Wilson & Wiysonge, 2020).

Evidence shows that trolls and bots originating in foreign countries attempted to influence the 2016 U.S. election. Furthermore, more commonly accepted by conservatives, conspiracy theories describing covert government activities surrounding COVID-19 may influence voting patterns. In addition, from a public health perspective, these targeted online debates create the impression that there may be more disagreement around vaccines than in reality (Dyer, 2018). Finally, this strategy may elicit doubt among parents, who had planned on following medical advice, to reconsider vaccination.

Ethical Issues

As COVID-19 vaccines were being developed at “warp speed,” ethical questions were emerging at a comparable rate. Some of these ethical questions were discussed in more detail in Chap. 7. However, several vaccine-specific ethical dilemmas are explored below.

Mandatory COVID-19 Vaccinations and Seat Belts

In societies valuing individual autonomy, mandated vaccinations are controversial. Arguing that immunization is for the collective good and paternalistic coercion is justified, Giubilini and Savulescu (2019) use a mandatory seat belt law analogy. When initially proposed, U.S. automobile seat belt laws faced some opposition, including the argument that governments were limiting individual freedom. Quantitatively, while there are risks associated with seat belt use,—“seatbelt syndrome”—involving intra-abdominal injuries and the difficulty in getting out of a car that is on fire or underwater—these are rare circumstances (Giubilini & Savulescu, 2019). In the United States, seat belts are estimated to save 15,000 lives per year.

Like wearing seatbelts, measles vaccinations include a small risk of febrile seizures (one per 1000 doses). There is also a risk of a skin rash with bruising (1/24,000) (Giubilini & Savulescu, 2019). Measles also includes both of these outcomes. In low-income countries, measles death rates can be as high as 1/100 and 1/5000 in higher-income countries. Giubilini and Savulescu (2019) argue that coercive paternalism in mandating vaccines is justified from a cost-benefit and probability perspective. With COVID-19, case fatality rates are declining, but at one plateau point it was at 1% of those infected. While adults are autonomous decision-makers, young children do not have this cognitive ability. Using similar logic as with children of members of the Jehovah's Witness Church, parents, as adults, can refuse blood transfusions for themselves but cannot refuse on behalf of their child.

The seat belt analogy has spurred discussion among ethicists around COVID-19 vaccine hesitancy (de Miguel-Beriain, 2022). Some scholars have taken the case for mandated vaccinations, further suggesting that countries are "at war" with COVID-19, and under the circumstances, "conscription" is appropriate. An unknown factor in the harm analyses is the unpredictable long-range effects of the COVID-19 vaccine—this information is available for measles immunizations. Additionally, the frequency of COVID-related adverse events is still being quantified, but symptomatic reactions likely vary with age and comorbid conditions (de Miguel-Beriain, 2022). Some have argued that because of this variability, blanket mandates for COVID-19 vaccines similar to seat belt laws are not justifiable (de Miguel-Beriain, 2022). In the United States, healthcare decisions are often ultimately decided by the courts rather than by ethicists. To date, the legal case against mandated vaccination has generally been unsuccessful.

Health Care for the Unvaccinated

As discussed above, since the days of the polio vaccine, immunization refusals have become much more common. An ethical and clinical issue arising with vaccine refusals is whether physicians should "fire" patients from their practice who do not follow medical immunization guidelines. Some physicians have refused to continue to care for unvaccinated patients. In most cases, these cases involve parents refusing to have their children vaccinated. This dilemma, preceding the COVID pandemic but now taking on additional implications, is whether physicians must provide care to patients who do not follow standard vaccination recommendations. In a 2010 Canadian survey of parents of children under the age of 16, 5% were reportedly told by a physician that their children would be refused care if unvaccinated (MacDonald et al., 2019).

The American Medical Association and American Academy of Pediatrics have discouraged physicians from "firing" patients from their practice because of failure to get a vaccine. Guidelines for communicating with patients and parents about vaccine refusals have recently become available (MacDonald et al., 2019). In these discussions, while providing factual content about vaccines'risks, benefits, and possible side effects, eliciting parents' concerns about vaccines in a non-judgmental way is also likely to be helpful. Rather than discussing vaccination in general, it is recommended that issues with each vaccine be addressed separately. Providers are discouraged from using confrontational approaches such as stating common vaccine myths and disputing them (MacDonald et al., 2019). Some of the communication skills used to address health risk behavior, such as cigarette smoking, have been adapted to vaccine discussions. Discussions should also include attention to the public health implications of vaccination refusal.

Caring for COVID Patients Who Refused Vaccination

With COVID-19 vaccines widely available for most age groups in the Global North, healthcare professionals often care for seriously ill, unvaccinated patients who have developed severe COVID-related complications requiring hospitalization. Whether these unvaccinated patients warrant the same level of care as those who have had the vaccine has stimulated uncomfortable discussions. The issue of prioritizing patients by vaccination status is most likely to emerge due to limited healthcare resources. At present, a disproportionate number of patients hospitalized with COVID-19 are unvaccinated. These patients are often very ill and require intensive care units—a limited resource. Frustration arises among hospital staff when a patient who made a deliberate decision to avoid taking action that would prevent or reduce the severity of their illness, requires a high level of care. While the ethical principles of equality and justice would lead to admitting and treating patients without considering their vaccination status, Shaw (2022) argues that these patients are not enduring discrimination since they have equal access to the vaccine. In essence, they have passed by the triage portal of equality, leading to their current acutely ill status. Shaw (2022) also points out that in addition to hospital staff's time and energy, the unvaccinated COVID-19 patient's hospitalization may delay surgery and chemotherapy for other patients. Shaw (2022) notes that minority populations may not have ready access to vaccination and that this factor should be considered.

International Vaccine Access: An Issue of Fairness

While discussing issues of vaccine hesitancy and access within national boundaries is customary, ethicists have challenged this limited geographical scope (Jecker et al., 2022). Justice as fairness (Rawls) is the predominant ethical principle in vaccine distribution. The moral question centers on the fairest approach to vaccine distribution worldwide. Wealthier countries are making booster shots available, while many Global South residents have not had access to an initial vaccination.

Jecker et al. (2022) suggest the European Union (E.U.) as a model for addressing the national-international responsibility to care for others. In forming the E.U., the Maastricht Treaty established the principle of subsidiarity. Subsidiarity was invoked to address the tension between government officials' commitment to the citizens of their respective countries versus the Union as a collective body. Politically, for Europe's citizens to accept membership, it was necessary to clarify the responsibilities of each government relative to commitments to the Union as a superordinate body (Jecker et al., 2022). The rule of subsidiarity established at the formation of the E.U. was that if a nation could not solve the problem itself, it could call upon the resources of the Union.

Jecker et al. (2022) define two types of subsidiarity—horizontal and vertical. The horizontal dimension involves sharing resources among a broad array of groups.

This principle would mean that nonprofit and for-profit sectors would work collaboratively to address a problem, such as COVID-19. Vertical subsidiarity refers to the concept that global responsibilities must be addressed, and even local health departments are part of an international movement to solve a worldwide goal. This perspective, also endorsed by the World Health Organization, argues that internationally, a just response to the pandemic would be that all global citizens receive an agreed-upon baseline level of immunity before receiving further vaccinations. While this approach seems fair, the power of national interests has made it unlikely as an achievable goal.

Conclusion

From a historical perspective, the development and dissemination of the COVID-19 vaccine were accomplished in record time. However, while mass vaccination against common infections and potentially lethal diseases is one of public health's outstanding accomplishments, it has never been without controversy. Fear of vaccines has been present since the days of variolation. In nearly all of the few unfortunate episodes where harm has been directly attributed to vaccination, the vaccine was defective. However, there have been many publicized false narratives linking vaccines to conditions such as autism. Even when the alleged injury associated with a vaccine is eventually refuted, the initial threatening message remains and may take on greater significance with repetition. Coincident with the COVID-19 pandemic, resistance to vaccination was escalating. Vaccines have become the symbolic repository of a growing distrust of government, science, and healthcare institutions. Vaccine hesitancy remains a significant obstacle—particularly in the Global North. As of August 2022, news reports are describing possible cases of polio, a disease previously eradicated in most countries, returning to the United States. The less than optimal uptake of the COVID-19 vaccine and the virus's mutations make complete herd immunity unlikely.

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Chapter 9
COVID-19 Testing, Preventive Measures, and Ethical Issues

Megan Hall

Introduction

The novel Coronavirus is known for evading tests and eluding contact tracing. Before polymerase chain reaction (PCR) tests for SARS-CoV-2 were created in February 2020, screening for infection through temperature checks and self-reported health checks were widely used. As the virus spread through China, social media became flooded with photos of people attempting to board trains traveling between Shanghai and Hong Kong. Wearing masks, each person stopped to get their temperature checked by a contactless thermometer before boarding. As COVID-19 spread to other countries, this fast and easy method of screening became normal at grocery stores, hospitals, pharmacies, and other essential workplaces, leading to contact tracing and self-isolation. One systematic review noted, however, that contact tracing or self-isolation alone missed 75% of cases, and that self-screening, contact tracing, and quarantine are most effective when they are combined (Girum et al., 2020). In terms of preventing the spread of COVID-19, this gave countries that chose to use multiple preventive measures an advantage for counteracting the novel Coronavirus in its early stages.

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Polymerase chain reaction (PCR; also called RT-PCR or NAAT[1]) tests were originally designed to find a particular segment of DNA or RNA and amplify it in an assay before visualizing it with a probe (Schochetman et al., 1988). In other words, a PCR test for SARS-CoV-2 can find and identify a particular genetic sequence associated with the virus on a molecular level, indicating whether a person has COVID-19. These tests were a breakthrough in prevention and allowed for more accurate contact tracing. However, unlike screening, access to PCR tests is limited. A saliva sample or nasal swab, which is usually taken at a laboratory, hospital, or other institution, is required for a PCR test; thus, these tests are essentially inaccessible to those in rural communities or who cannot leave their homes. In lieu of this, tests for antibodies or antigens, such as rapid antigen tests (RATs) or lateral flow tests (LFTs) were developed (Bevan et al., 2021). Unlike a PCR test, rapid antigen tests can be used at home in 15 min, allowing for access and flexibility. However, rapid antigen tests are less reliable than PCR testing; they search for COVID-19 antigens, which trigger antibodies to react in an immune response. Rapid antigen tests are not as successful at detecting COVID-19 in their early stages as PCR tests. Either way, there are pros and cons for both types of tests, one of which is highly sensitive and the other easier to access with faster results.

Who Used Test Results, and for What Purpose?

Despite being relatively accurate, it is possible to have a false positive or false negative result on a PCR or rapid antigen test. Studies have shown that rapid antigen tests are approximately 63% accurate, with more false negatives than false positives, compared to PCR results (Tsao et al., 2022). Given that PCR tests are considered a gold standard, it is hard to know about the specificity of tests—a literature review showed that false negative rates ranged from 2% to 58%, with an average of 12% and a lot of varying factors (Pecoraro et al., 2022). As a result, many choose to use an easily accessible and inexpensive test, with the risky consequence of having an incorrect test result. This choice of tests may especially be the case if an individual has significant financial strains or lives in an area where it is harder to get a PCR test. In rural areas, for example, many still struggle to get tested due to a lack of permanent testing centers, few pop-up clinics, and a lack of communication regarding pop-up clinics (McElfish et al., 2021). Suppose an individual tested positive but suspected the result might be false. In that case, they might use a second test of the same type or a more accurate test, despite the lack of accessibility and higher cost,

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[1] RT-PCR stands for reverse transcriptase polymerase chain reaction, and NAAT stands for nucleic acid amplification test. A reverse transcriptase polymerase chain reaction test is the full name for the polymerase chain reaction test used for SARS-CoV-2, as it is specific to RNA and requires reverse transcription. RT-PCR is one type of NAAT, which identifies genetic material; in this case, it identifies genetic material in RNA that is part of SARS-CoV-2. Importantly, these terms are, colloquially, used interchangeably (Nucleic Acid Amplification Tests, 2021).

to confirm their result. However, this practice also created confusion when results conflicted, sometimes leading to distrust or conspiracies directed toward the government and major scientific organizations. An extreme conspiracy theory depicted the use of COVID-19 tests as a way for the government to give what is in the COVID-19 vaccine to those who were unvaccinated without their knowledge (Fichera, 2021). Aside from mistrust, this is evidently impossible, as the only vaccines we have as of 2022 must be administered as an injection. Individuals who test negative, but are positive for COVID-19, sometimes remain unaware of their illness and often continue to go about their daily lives, including participating in large gatherings and spreading COVID-19. That said, individuals were not the only ones who have used the results from COVID-19 testing throughout the pandemic.

Governmental and non-governmental organizations and individuals have used test results. These test findings were used extensively by organizations affiliated with the government and other public institutions for contact tracing and preventing the spread of infection through surveillance testing. Travel often required some testing; for example, in China, temperature screening before travel by trains was needed and became more popular in other countries during the pandemic, and PCR testing has been used often for international travel throughout the pandemic. In addition, health services were made available in some countries specifically to those testing positive for COVID-19. For example, in jobs that required one to work in person before the vaccine was provided, individuals were termed “frontline workers,” and contact tracing was used to prevent the spread of COVID-19 to workers who were in close contact with one another and to provide employees who became sick with time off. Finally, researchers such as epidemiologists, psychologists, sociologists, and other medical and public health professionals used contact tracing data. Researchers analyzed and interpreted the data from contact tracing to understand factors influencing the spread of COVID-19, who was most at-risk for getting COVID-19, and what symptoms were occurring in those who contracted COVID-19. One interesting application of contact tracing that does not directly involve testing is through mobile applications.

In the United States and the United Kingdom, privacy is considered essential. However, the results of testing and conducting contact tracing are often not well understood by the general public; many believe that their private information will be released in some format, which is not the case. In Taiwan, however, young adults were found to accept at a rate of 75% or greater three different potential apps for contact tracing, even though they would have to share their private information with a third party (Garrett et al., 2021). South Korea had consistently low COVID-19 case rates, partly because they used contact tracing that included credit card tracking, mobile phone tracking, and video camera recognition for contact tracing. However, these practices have previously raised privacy concerns because of perceived invasiveness (Lee & Lee, 2020). South Korean public health officials used mobile phone notifications, applications the general public could use to find out where others infected with COVID-19 were in real-time, and employed extensive drive-through testing.

Ethical Implications and Diagnostic Justice

The primary purpose of public health is to improve the health of the entire population—it is not to provide individual treatment. As more formally noted by the World Health Organization, "[Public health is] the art and science of preventing disease, prolonging life, and promoting health through the organized efforts of society" (WHO Definition of Public Health, 2020). However, public health ethics focus heavily on balancing individual autonomy and protecting the public's welfare. Ethical issues in public health are complex. Officials not only focus on principles such as nonmaleficence, justice, autonomy, and beneficence as starting points but also have obligations to the community they serve. For example, while ensuring those who may have a disease can be diagnosed, those who work in public health must ensure these individuals have limited social contact to prevent the spread of the disease to others. In the case of a highly infectious disease such as COVID-19, public health professionals are still determining the best practices for disseminating information to society as a whole. Concurrently, patient privacy must be preserved as much as possible. Aside from individual treatment, much of the data from testing for surveillance of the general population was used for purposes of which individuals were not necessarily informed or for which they did not consent. Pandemics bring major ethical theories into sharp relief. Deontological ethics that focuses on individual duties and obligations, principlism's emphasis on autonomy, and utilitarianism, in which the collective benefit for society are emphasized (Coughlin, 2006), are all relevant.

One method of surveillance, wastewater testing, minimally impacts autonomy as it does not invade personal privacy while serving as a form of community surveillance. Wastewater testing in the United States, importantly, occurs before water from sewage enters a treatment plant; wastewater is treated before it is used as tap water. Other countries may not treat water for drinking and may suggest drinking bottled water. Still, wastewater will not typically be used in a developed country for cleaning dishes, bathing, or doing laundry. Wastewater testing can be used to determine if COVID-19 or other viruses are present in the sewage from a specific community. However, instead of identifying individuals who may have COVID-19, wastewater testing only allows the government to know whether COVID-19 is present, increasing, or decreasing in a community. Wastewater provides a non-intrusive approach to monitoring COVID-19 levels in a community (Shah et al., 2022). This approach can help predict when and where there may be an increase in COVID-19 cases. However, while wastewater surveillance in large areas is commonly used to understand and predict community levels of a particular disease, it does not provide micro-level information about whether certain groups are more at risk than others or to understand who is asymptomatic.

From a utilitarian perspective, using surveillance data to track individual cases as South Korea did is acceptable because it benefits society despite potentially threatening individual privacy (Lee & Lee, 2020). However, the lack of informed consent and the right to privacy has been debated. Diagnostic justice is one ethical theory that addresses this issue (Kennedy & Cwik, 2021). In diagnostic justice, fairness for all individuals matters most. Given the circumstances and resources available, surveillance testing may or may not be considered morally acceptable compared to alternatives. Specifically, it may be admissible despite the right to privacy because surveillance testing provides greater and more equitable benefits to society as a whole. In other words, when testing for treatment purposes only, one provides tests as quickly and equitably as possible. However, in the early days of the pandemic, with an emerging virus, lack of reliable tests, and asymptomatic individuals, the multiple unknowns challenged the principle of equity. This judgment was particularly challenging when knowledge of the virus and the reality that it impacted individuals differently, including the absence of symptoms, created ambiguity.

One issue with a diagnostic justice framework is that data from surveillance testing are mainly used to inform public policy instead of directly benefiting individuals. However, surveillance data are used to allocate treatment and preventive resources at the community level. These issues may lead to reduced support for marginalized groups who refuse to get tested out of distrust of the healthcare system. Black, Hispanic, Latino/a/e, and Indigenous people are disproportionately affected by COVID-19, tend to lack access to healthcare, and have had histories of being harmed by the healthcare system. When deciding whether or not to get tested for COVID-19, people consider their own and other's vulnerability. However, resource considerations, such as the ability to work if they tested positive, the ability to afford treatment, and the hospital's resources were also taken into account (Perry et al., 2021). These resource considerations were stratified by race, explicitly affecting Black and Latino/a community members. In addition, those who are immunocompromised remain at risk. At the same time, members of the general public and some public policies dismiss COVID-19 as something that has ended. From the perspective of individual autonomy, surveillance data would optimally be used to provide individuals with as much freedom and protection as possible, such as through the use of immunity passports or vaccination passports, which would allow people who had been infected with COVID-19 or have been vaccinated to have more personal freedoms (Voo et al., 2021). The concept of a vaccine or immunity passport has ethical implications and has also been heavily debated regarding potential consequences.

International Perspectives and Inequalities

While some countries have required, and still require, a negative COVID-19 test to travel internationally, these policies change frequently and vary by country. Some public health officials have proposed criteria for an immunity or vaccine passport such as a prior history and subsequent recovery from COVID-19 and/or complete vaccination against COVID-19. Passport holders would have certain privileges, such as the ability to travel by air, attend some events, or enter certain countries (Hall & Studdert, 2021). Regarding travel, the idea of a strict vaccine passport for travel has many issues, such as the fact that those who can readily get vaccinated will be a somewhat restricted group, and there will be barriers to minorities. Furthermore, as more strains of the original SARS-CoV-2 virus mutate and more COVID-19 boosters are required, the definition of a "vaccine passport" must be defined in terms of the number of vaccinations one must have had or the timing of the most recent booster. Currently, many restrictions are established by individual companies instead of the government, with the airlines a prime example. However, internationally, government regulations differ; PCR tests are required for travel in many countries, but protocols can be more or less strict.

Travel restrictions have impacted the international community, especially those living in countries with little access to healthcare or fiscal resources. To travel in the first place, those living in a country with little access to healthcare must obtain the COVID-19 vaccination and often must get tested, in addition to other travel costs. For those who once frequently traveled to visit family and friends, greater risk is involved. Should that person contract the SARS-CoV-2 virus on the airplane or during their stay abroad, they may be forced to extend their stay in a country where the cost of living is higher than in their home country to get well and isolate themselves to protect others.

Further, if hospitalization is required, this would also disproportionately affect those traveling from outside of the country, who may not have health insurance while traveling and may be burdened with additional economic consequences they were not expecting. As nations have dropped mask mandates and begun to gather in-person in late 2022, major international events without masks have resulted in COVID-19 outbreaks. Large indoor events have been colloquially termed "superspreaders" due to the large number of people who tend to test positive for COVID-19 afterward. These challenges have negatively impacted international travel, especially among individuals living in the Global South.

From an international perspective, the ability to prevent the spread of COVID-19 may be limited. The Human Development Index (HDI), a measure used by the United Nations that includes three main dimensions: a long and healthy life, knowledge, and a decent standard of living, was a significant predictor of testing (Marziali et al., 2021). Globally, significant inequities in living may be predictive of an inability to test for COVID-19 on a large scale. In Nepal, Giri and Rana (2020) argue that a lack of resources for testing, such as affordable RNA extraction kits and technology to process results such as QT-PCR[2] machines and computed tomography scanning, contribute to inequities in countries in the Global South. However, Nepal's lack of trained personnel or technicians who can use devices for viral RNA extraction and qPCR testing is also a barrier. In addition, specific biosafety requirements must be met; when Giri and Rana (2020) wrote their article, only 13 labs were authorized to handle COVID-19 samples for 29 million people living in Nepal. It was evident that, aside from testing, preventive measures were necessary to stop the spread of COVID-19.

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[2] Quantitative transcription PCR, or qPCR, is a form of technology that allows for quantification of genetic material in RNA transcripts that have been reverse transcribed in DNA (Heid et al., 1996).

Social Distancing and Implications for Marginalized Communities

The main preventive measures used during the COVID-19 pandemic have included social distancing and mask-wearing. Social distancing and mask-wearing policies have changed throughout the SARS-CoV-2 pandemic. In March 2020, when COVID-19 was first declared a pandemic, many countries issued guidelines to isolate at home for a while. The most severe form of this policy was quarantine. This restriction was applied to people believed to have been exposed to the COVID-19 virus.

Although it was necessary, periods of isolation and quarantine had harsh consequences in terms of economics and mental health, especially for those with fewer resources, less social support, and who were not retired or could not work from home. Loneliness was considered a significant issue, even before the pandemic; as elderly populations began to live away from family, young adults tended to move around more frequently and get married at older ages, with fewer long-term social connections. In this context of quarantine, social media may have helped ease loneliness. Cauberghe et al. (2020) found that teenagers who felt lonely or anxious during the COVID-19 pandemic may have used social media to connect with their friends and cope with their situation. Studies have found that well-being can improve by actively posting on social media, commenting, or interacting with others (Escobar-Viera et al., 2018). On the other hand, social media use during quarantine may have also fed misinformation or led some to engage in social comparisons, in which they compare themselves to others who only post the best aspects of their lives online (Midgley et al., 2021). Some may also aimlessly scroll through their social media feed in what is colloquially termed “doom scrolling” or scrolling through social media passively, which has been associated with poor mental health (Turel et al., 2018).

Concerningly, in a global study of loneliness pre-pandemic and during the pandemic, loneliness increased from 6% to 21% (O’Sullivan et al., 2021). This study found that certain factors also made people more likely to feel lonely, such as how long they had lived in their neighborhood and how close-knit it was, and the amount of financial support they had and their employment status. Further, females were more likely to experience higher levels of loneliness than males. There were also certain factors, such as increased alcohol consumption and lack of sleep, that were associated with increased loneliness only during the pandemic. Countries in which multigenerational households are common or countries that provided equitable economic support during the pandemic, may have had better mental health outcomes due to increased family support and financial resources. A clinic in Mumbai, India, used the Patient Health Questionnaire (PHQ) to screen people who had asymptomatic or mild COVID-19 at their first appointment and at a follow-up 6 months afterward (Singh et al., 2022). The PHQ screens for anxiety and depression; this study specifically found that depression rose across timepoints, especially in males above the age of 45 and those who were re-infected. In India, families often rely on men for financial support while women act as caregivers, so men may be more demoralized if they are unable to work and support their family. Thus, cultural differences, as well as inequities, must be considered.

Isolation and Family Violence

When stay at home and lockdown policies were initiated, there was concern about an increased risk in domestic violence. Prior to the pandemic, potential victims of domestic violence would normally be able to escape their abuser during work or school. However, persons with a history of domestic violence were "locked down" for weeks or months during the pandemic with a potential victim. Domestic violence that occurs between two partners often emotionally impacts children whom they care for, whereas family violence may include child abuse. The COVID-19 pandemic created an unstable economy, unemployment, which may have acted as a stressor; some studies found an increase in alcohol use (Campbell, 2020). Alcohol use and unemployment have, in the past, been associated with domestic violence risk (Kyriacou et al., 2017) especially in cases involving financial stress, leading to a cycle involving family violence (Krishnakumar & Verma, 2021).

Due to social isolation, there was suddenly limited access to resources, such as social support systems, emergency services, etc., that were previously readily accessible. In 2020, there was a rise in Internet searches related to support services for domestic abuse; Google reported an 80% increase in these searches during this time (Neil, 2020). In many countries, there was an increase in domestic abuse service needs, and in some countries police reported an increase in calls related to domestic abuse. In the United States, municipalities reported an increase in domestic violence to the local police ranging from 10% to 27% higher compared with the previous year (Boserup et al., 2020), despite drops in crime (Usher et al., 2020). There has also been a rise in domestic homicides in certain countries during the pandemic (Caroline & Louise, 2020). In one study conducted in Wales, there was not a significant increase in reports of domestic violence between December 2019 and July 2020; however, the majority of those who reported violence were children or adolescents, whereas it was often neighbors or teachers prior to the pandemic (Moore et al., 2022). Trapped in a high-risk environment, these youth may have been forced to call for help. Notably, there was a drop in reports of child abuse, and there are concerns that cases related to child abuse were underreported during lockdown (Campbell, 2020). However, even as lockdown ended and children returned to schools, it is hard to know if child abuse cases were under detected or not, especially if a child was not considered "high risk" by healthcare and legal workers (Caron et al., 2020). This pattern raises concerns about how those who were victims of family violence during the COVID-19 lockdown will cope moving forward (Bradbury-Jones & Isham, 2020).

Many mental health professionals were further concerned about family violence directed toward LGBTQ+ youth and other minorities. Unfortunately, those who identify as LGBTQ+ did experience an increase in multiple types of family violence, including physical and non-physical family violence, such as verbal abuse during the pandemic (Drotning et al., 2022). Those who are bisexual experienced the highest rates of violence before and during the pandemic. Heterosexual women, but not heterosexual men, also experienced an increase in family violence. Notably, those who experienced an economic loss were more likely to report domestic violence (Drotning et al., 2022). Victims of family violence, who were sometimes from a lower socioeconomic background, seemed to have significantly elevated stress during the pandemic and less access to financial resources, social support, therapy, and other mental health (Moreiro & DaCosta, 2020).

The Impact of Quarantine on Education

When SARS-CoV-2 was declared a pandemic on March 11, 2020, many schools in countries that had not already been impacted by the virus announced that they would not be meeting in-person. For parents and guardians who had to work from home, they suddenly had a dual role as teachers. Abuhammad (2020) provides an overview of the logistical, technical, fiscal, and other problems faced by parents in Jordan who struggled to adapt to distance learning. For parents and guardians who had a job that remained in-person, they were forced to search for a caregiver that could be trusted to not only watch over their child but to also avoid getting infected with COVID-19. Further, these parents had to pay for childcare, which was not usually the case if their child attended a public school; families of reduced financial means at this time lost meals often provided free throughout the public schools.

In countries that had the technology available, classes moved to an online format, and tools such as Zoom became popular. However, internet access was not necessarily readily available to everyone when classes moved to Zoom, and in countries where computers were not readily available this was not an option at all. Further, students experienced burnout due to the lengthy time spent viewing a computer screen, colloquially termed “Zoom fatigue.” Youth struggled in school, and studies found that many lost at least a full year of learning (Hoofman & Secord, 2021). Those with attention deficit hyperactivity disorder (ADHD), and other students with disabilities struggled to learn from home or virtually (Becker et al., 2020). The lack of a structured lifestyle, for these students, led to worse mental health outcomes—particularly for Black and Hispanic students as well as those from lower income families (Cardenas et al., 2020). Adolescents and young adults missed many major life experiences and opportunities for growth alongside peers; however, this age group now had fewer people in which to confide because of a reduced social circle.

As the emerging adult population shaped their future self-identity, the uncertainty of the future played a role in the development of psychological distress and higher suicide risk (Bixter et al., 2020). Uncertainty toward the future, is further implicated in academic outcomes and decision-making. Schools largely did not begin in-person again until after the COVID-19 vaccination became widely available and students were able to be vaccinated; this was heavily dependent on the location of the school and the population that attended, however, as vaccinations for those under the age of eighteen were not available until much later than the vaccine intended for adults.

Some schools required proof of vaccination for returning students who were eligible for a vaccine. Other schools only required masks, or chose to conduct random testing. Schools sometimes used plexiglass barriers and attempted to implement social distancing practices as well. Notably, not all children disliked remote learning, or preferred learning in-person (Lawrence & Fakuade, 2021). Parents and guardians who became used to working from home, adjusted to teaching their children, and had the fiscal means chose to continue homeschooling their children in some cases. This decision was for a number of reasons, such as dislike of the education system, fear of their child catching the virus and their child enjoying and doing well with remote learning. Notably, only 50% of parents planned to have their children return to school in 2021, while 18% remained undecided; the biggest factors in this decision were availability of vaccines, whether staff and students would be required to wear masks, and whether masks, hand sanitizer, and COVID-19 testing would be available (Meghani et al., 2022). For children who did return to school, especially before a vaccine was readily available, masks were sometimes the only method of prevention from the virus, and they were heavily recommended if not required.

Masks as Prevention

In some countries, such as China, Japan, and South Korea where masks were already commonly worn when one was sick, mask policies were put in place immediately. In other countries, such as the United States, Canada, and the United Kingdom, mask-wearing was a new phenomenon during the COVID-19 pandemic, and mask-wearing outside of healthcare settings was heavily debated. In the United States, masks have been extremely divisive; public officials initially discouraged mask-wearing in favor of handwashing, and the US Centers for Disease Control (CDC) did not recommend masks as a preventive measure until April of 2020. Unfortunately, major health organizations changed their policies quite frequently and did not clearly communicate the rationale for their decisions in the beginning of the pandemic; however, this reluctance, notably, may have been influenced by political agendas as the former president, Donald Trump, did not wear masks. Even 2 years later in the United States, some people are anxious if not wearing a mask, while others are annoyed when they have to wear a mask. As of August 19, 2022, the CDC no longer recommended wearing masks or quarantine measures, despite rising COVID-19 cases, increasing the division between those of different socioeconomic status or racial backgrounds, as those who are marginalized are more likely to suffer from these policies.

As the pandemic seemed to get better or worse, mask policies generally fluctuated with these waves. Higher death rates and less hospital capacity generally meant that masks were required in some areas, and vice versa. Masks themselves were also generally known to differ in structure and effectiveness. At the beginning of the pandemic, N95, KN95, and KN94 masks, which are still most highly recommended as they fit one's face tightly and prevent nearly all aerosol particles from entering the nose and mouth, were nearly impossible to find in some countries. Even surgical masks, which are considered a good option as they have filters, were hard to find, and were often reused. Some individuals began making cloth masks, which provided some, albeit less, protection against COVID-19. As resources for cloth masks were made available, they were provided in a variety of colors and patterns, which led some to wear a specific mask to support a political or social cause. As COVID-19 is an airborne disease, small particles that were spread by coughing or sneezing could spread throughout an indoor space easily; masks prevented this spread by filtering out small particles and preventing them from being inhaled (Liao et al., 2021). Larger droplets could remain in the air for longer periods of time, and all of this was affected by filtration or lack thereof. Lack of filtration led to the more recent movement toward High-Efficiency Particulate Air (HEPA) purifiers and cheaper Corsi-Rosenthal fans that could be built with a regular fan and boxes as children went back to school and adults began working in office settings once again, creating crowded, indoor settings.

Science Communication in Public Health

One unique use of test results has been through scientists' use of their own test results for the purpose of communicating their stories through social media platforms, such as Twitter. For example, they might provide their own rapid antigen test results when they get sick, and use a rapid antigen test each day until the line indicating that the COVID-19 virus is there fades completely; some compare this to their results from a PCR test, or to the rapid antigen tests from others who live with them who became infected.

Many scientists who try to spread accurate, information about COVID-19 have been met with condemnation from some who belittle the virus and its effects (Mello et al., 2020). This disagreement has gone beyond social media posts and has included threatening messages from segments of the general populace directed toward public health workers as well as vandalism and protests at public health workers' personal residences. These threats may have led some public heath authorities to remain silent out of fear, and many have tried to seek safer and more effective ways to engage with their community, while others have chosen to leave their position. There have, further, been disagreements about the virus itself between certain politicians and the scientific community; such intergovernmental arguments fostered confusion among the public and further anger toward public health workers. For example, surveys conducted between November 2020 and August 2021 found that those identifying as Republican were more likely than Democrats to believe that threats toward public health workers were justified (Topazian et al., 2022). Further analyses demonstrated that those who did not believe in science were more likely to believe that threats toward public health workers were justified (Topazian et al., 2022).

As more data have emerged and policies continuously change, there is disagreement within the scientific community, including arguments regarding what forms of testing and masking should be required, how COVID-19 is spread and its classification as a pandemic. Topazian et al. (2022) suggest that individuals may be experiencing "pandemic fatigue," or weariness of acknowledging and living with the COVID-19 pandemic, despite a belief in science. Although many factors play into varying beliefs about the pandemic, Stosic et al. (2021) also found that belief in science was related to mask-wearing, and concluded that improved health messaging targeted at those who were demographically less likely to wear masks could be helpful.

Political Issues Surrounding COVID-19

Misunderstandings spiraled out of control and to many conspiracy theorists, COVID-19 became "Fake News"; in other words, it became a hoax. As contradictions seemingly spread everywhere, extremists took advantage of this. Single graphs from preprints of scientific papers were taken out of context and explained in a seemingly simple way. One graph from a study done in Israel, then a preprint (see Witberg et al., 2021 for the peer-reviewed study), showed that myocarditis, an inflammation of the heart, affected more people, numerically, who were vaccinated than those who were not vaccinated. However, the unsubstantiated warnings that appeared on social media did not explain that this seemingly increased risk was still within a normal range at approximately 2.13 cases in 100,000; the conclusion was that there was no heightened risk of myocarditis when comparing those who had gotten vaccinated and those who had not, but that there was a heightened risk of myocarditis in those who had contracted the SARS-CoV-2 infection at approximately 146 cases in 100,000 (Pyle & Huang, 2022). More recent research conducted in Korea has shown similar results (Kim et al., 2022). These seemingly simple explanations that catastrophize graphs or sentences taken out of context are a major way in which both real people and bots spread disinformation about COVID-19, making it seem like the virus is fake or akin to a simple cold, or false warnings about the vaccine's adverse effects.

Much of the divisiveness on social media and likelihood for certain politicians to agree with or endorse certain policies created a separation not just between those who agreed with vaccination, testing, and masking policies, but also a separation between different sides of the political spectrum. Politically, liberal tendencies seemed to be associated with agreement with public health policies and regulations, while conservative tendencies generally were not. Amidst a pandemic, this association, which was never intentional, simply created further strife. Political ideology has been considered a potential social determinant of health and is known for being involved in health-related decisions. Because social identity is connected to group identity and cohesiveness, it is thought that political ideology is heavily connected to a desire to keep this identity and maintain status in groups who think similarly to oneself in terms of politics. Across multiple surveys, political ideology was related to COVID-19 preventive behaviors, policy support, risk perception, and the intent to be vaccinated (Geana et al., 2021).

Interestingly, conservatives are typically more individualistic and likely to sense threats harmful to the individual versus society (Choma et al., 2013; Jost, 2017, as cited in Geana et al., 2021). This threat could be a threatening pathogen or the personal threat toward oneself from a disease (Tybur et al., 2016; Geana et al., 2021). This factor should have led to greater perception of COVID-19 risk by conservatives than liberals (Calvillo et al., 2020 as cited in Geana et al., 2021). One theory posed by Geana et al. (2021) is that what led to the opposite effect in the case of COVID-19 was the mitigation solutions proposed by the government, such as closing schools and gatherings, which could be seen as impeding on one's freedom (Campbell & Kay, 2014, as cited in Geana et al., 2021).

Although Republicans tended to dislike mitigation efforts and have spread misinformation about the pandemic, Democrats have also used COVID-19 policies in politics. In a recent example, President Joe Biden stated that "the pandemic is over" in an interview on the TV program, 60 Minutes, on September 18, 2022, causing backlash and controversy as the average death rate due to COVID-19 in September 2022 was 300–400 deaths per day in the United States. However, for moderates who had already begun to leave their masks at home, chose to forgo testing, and were returning to a version of "normalcy," this statement would be welcome, especially in the context of the upcoming Congressional elections in November 2022. However, there is no research that completely supports President Biden's conclusion. At this point, we can acknowledge that both the Republican and Democratic parties in the United States have left choices related to mitigation of COVID-19 up to individuals, with minimal public health guidance.

Facemasks as a Political Statement

Multiple studies have shown that consistent facemasks and eye protection effectively reduce COVID-19 transmission. However, in countries where the presence and/or significance of COVID-19 was minimized, facemask wearing became a statement of open disagreement with government policy. Initially, the President of Turkmenistan fined citizens for wearing masks. Other leaders minimized mask wearing but did recommend alternatives for protection from the virus. Turkmenistan's President reportedly encouraged "inhaling the smoke from a burning desert region plant." At the same time, Belarus's President recommended drinking vodka, driving a tractor, and steaming in a sauna as a form of inoculation (Rudolph et al., 2021). The former president of Tanzania, McGaughey, emphasized the role of divine forces since the COVID-19 virus was seen as a satanic force. Indonesia's Home Affairs minister suggested that consuming bean sprouts and broccoli would provide effective prophylaxis (Rudolph et al., 2021). Other prophylactic measures recommended by President Trump included injecting bleach or disinfectant (Wright, 2021). Hydroxychloroquine, touted by President Trump, has subsequently been determined to be ineffective in treating or preventing COVID-19.

In Canada, mask-wearing did not take on significant political overtones until May 20 2020. At that time, Prime Minister Trudeau indicated that he would be wearing facemasks in public and encouraged Canadian citizens to do so. Courtice et al. (2021) found that those who were surveyed after May 20 did show an effect for political affiliation. Canadians identifying as liberal rather than conservative were more likely to support and follow mask mandates. Of interest, those with higher levels of psychological reactance viewed mask mandates more negatively after May 20. The reactance factor is understandable in the context of the conservative values of individual freedom and minimal government interference in one's personal life.

What Have We Learned?

Over 2 years have passed since the start of the pandemic, and some countries are still heavily divided politically about the COVID-19 vaccine. Many citizens have refused to get tested, vaccinated, or wear masks due to the current political climate, and some countries have chosen to stop requiring any type of prevention or mitigation for the spread of COVID-19 as well. Further, those who are marginalized or are from countries with less access to medical facilities and resources have faced enormous challenges and higher death rates—many have not gotten tested, vaccinated, or worn masks not of their own volition, but due to lack of access.

One thing we have learned is that scientists predicted that there would be a pandemic (Vigue, 2020), but many citizens did not listen, and still fail to take precautions such as receiving the vaccine. We also know that a pandemic could happen again in the future, especially with fewer people getting vaccinated in politically divisive areas and areas with less access to vaccines. Further, it should be acknowledged that the ongoing COVID-19 pandemic is still harmful to certain groups and countries. However, we now know how to more effectively fight a major pandemic when it occurs through drive-in vaccinations, phone applications, and surveillance testing. Thus, more funding should be directed toward healthcare, virology, epidemiology, and similar fields, in addition to infrastructure for preventive measures like contact tracing and masks. Funding should further be directed toward preparation should a pandemic occur in the future. It is also true that illnesses in which the infectious agent is not visible, such as viral conditions, may become associated with political agendas and misinformation. When addressing anything related to science, governments, news, and social media should work more thoroughly and with scientists who are well-known and skilled at public communication to disseminate information clearly and accurately.

What does this mean for the general populace? Overall, there is a global willingness to be vaccinated of approximately 66%, with the highest willingness demonstrated in South America at 73.27% and in Oceania at 76.27%, according to a meta-analysis (Nehal et al., 2021). Lu et al. (2021) found that collectivism predicts willingness to wear a mask across 67 countries, in 51 languages, among hundreds of thousands of individuals, after controlling for variables such as GDP, universal healthcare, and demographics. COVID-19 and other viruses are most easily spread when the community one lives in either does not get vaccinated or does not take precautions such as social distancing and mask wearing, so one is safest when they do both, and those around them do both as well. Regardless of cultural norms, the main takeaway from this chapter is that doing what is best for others, as well as oneself, results in being less likely to get sick. It is also important to consider those with disabilities, especially those with a weakened immune system that predispose them to SARS-CoV-2 and higher hospitalization rates due to COVID-19 despite having been vaccinated. However, keeping in mind that vaccination is not possible for everyone, compliance with surveillance testing, mask mandates, and quarantine measures are extremely important for individual citizens and society as a whole. That said, there are ethical implications surrounding surveillance testing, and in addition to setting one's own boundaries regarding mask-wearing, event attendance, vaccinations, travel, and other heavily debated topics, being respectful of others' boundaries is also likely to be beneficial.

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Chapter 10
COVID-19: Where Are We Now? What Have We Learned?

H. Russell Searight

Introduction

This chapter addresses a selected number of key issues that arose during the pandemic. When possible, potential strategies for addressing these challenges are suggested. As noted previously, while COVID-19 raised some unique issues, many problems in responding optimally to the pandemic were long-standing; COVID-19 merely shined a spotlight on these issues. First, many recent illness outbreaks have been zoonotic in origin—infectious agents that "jump" from animals to humans. With climate change and environmental degradation, there is reason to believe that this pattern will continue. Second, COVID-19 highlighted the growing problem of income inequality. Third, the pandemic highlighted a pre-existing crisis in child and adolescent mental health exacerbated further by COVID-19. Recently, several reports have assessed the success with which established national and international agencies addressed the crisis. The absence of cooperation internationally, nationally, and even locally prevented a more potent and unified response to COVID-19. The pandemic initiated changes in health care practices. Some of these innovations or altered perspectives on health care will likely remain after the outbreaks of COVID-19.

A term used in natural disaster relief is "hypercomplex emergency;" Bly et al. (2020) define this type of extreme event as involving "multiple people at risk of harm, multiple jurisdictions responding, and resources that are not immediately available locally" (p. 3). As Boin and 't Hart (2022) point out, post-hoc analyses of government responses to an emergency rarely leave elected officials or high-level administrators unscathed.

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Government leaders often invoke what Boin and ‘t Hart (2022) describe as exogenous forces in these extreme events such as a crisis created by external forces, be it weather (“Acts of God”) or perhaps a hostile foreign power. However, these crises may provide an opening for those whose policy ideas were considered “too radical” in the past (Boin and ‘t Hart (2022)). Additionally, those who have been critical of the status quo for some time may experience public vindication. For example, while not leading to a long-term government policy of guaranteed income support, the Trump and Biden administrations’ provision of COVID-related financial assistance for a large percentage of U.S. households has opened the door to policy discussions of a previously inconceivable form of guaranteed income (Johnson & Roberto, 2020).

Future Outbreaks: The Rise of Zoonotic Disease

At least 60% of newly developing human diseases have originated in animals that harbor viruses that subsequently infect humans (Naicker, 2011). Since climate change and natural habitat destruction are becoming more pronounced and are significant contributors to this trend, animal-to-human transmission is likely to become increasingly common. The West Nile virus’ increase in North America has been linked to a temperature-related adaptive genetic mutation that increases viral propagation. Increased temperature also appears to be associated with extended viability for the MERS virus (Mishra et al., 2021). Global warming trends increase the geographic range of vectors such as mosquitos and ticks. As total snowfall declines, rodents who have been protected by snow are now more likely to seek shelter in human habitats (Naicker, 2011). The movement in food production toward industrialized farming with large numbers of animals housed together, in some instances with other species, promotes viral transmission within and across species (Naicker, 2011). The expansion of human activity and living spaces is encroaching on the habitats of multiple non-domestic animals. Recognizing the possible international public health consequences of future zoonotic conditions, surveillance of potential hosts may help identify future zoonotic threats. Recognizing that animal-to-human transmission is a global problem led the U.S. Agency for International Development to develop the PREDICT program as a multidisciplinary effort. PREDICT scientists are engaged in animal virus surveillance with particular attention to areas where the boundary between humans and non-domestic animals is becoming more permeable (Kelly et al., 2017).

Income Support

Several national governments included income support in various forms in response to COVID-19. In some countries, this assistance took the form of additional unemployment compensation. With some government programs, financial support was means tested such that a certain income level was required to receive aid, while in other countries, financial assistance was universal and unrelated to income. While guaranteed universal income is controversial, it is a possible partial solution to the problem of economic inequality. Despite the controversy surrounding a national guaranteed income (Calnitsky, 2020) which would require federal and state legislation, it is suggested that consistent income support may improve both physical and mental health. However, the research to date is limited. In the United States, the Coronavirus Aid, Relief, and Economic Security Act (CARES) was the first time that nearly universal non-contingent income support was provided to most citizens.

As a 2019 Democratic primary candidate for U.S. President, Andrew Yang put forth a policy of giving every American one thousand dollars per month, which would be covered through a value-added tax. The benefits of income support on health have not been well studied; however, with the income assistance plans enacted during the pandemic, data should be available to conduct further research and perhaps be used to develop evidence-based public policy (Bogenschneider & Corbett, 2021). COVID-19‘s societal impact appears to have made more people in the United States open to income support policies. A 10% increase in support for government regulations to improve quality of life was noted in the United States from 2019 to 2020 (Barry et al., 2020; Topazian et al., 2022). Nearly half of those surveyed supported universal health care, and about 35% supported guaranteed income assistance (Barry et al., 2020; Topazian et al., 2022).

A related policy that has been recommended centers on job security; a policy on secure employment is in the 1948 United Nations Universal Declaration of Human Rights. In the United States and Australia, guaranteed jobs have been proposed. In the United States, a public works program has been put forward that guarantees a base wage of $15 an hour. In addition, by offering a relatively high minimum wage, the government programs would then indirectly pressure private businesses to increase financial compensation for their employees (Hensher, 2020). One aspect of the CARES Act in the United States and a similar program in Australia was expanded unemployment payments. In addition, in the United States, small businesses were provided with grants to reduce layoffs (Paycheck Protection Program) and temporary tax credits through the Small Business Tax Credit Program (U.S. Department of the Treasury, 2022). While the programs did assist small and solo businesses, funds were limited, and some business owners found the application process challenging. Even more disturbing was the degree of fraud that has been reported. It has been estimated that over 100 billion dollars of U.S. COVID relief funds were effectively stolen. For example, a 29-year-old man was arrested for obtaining 3.9 million in COVID relief funds through the Paycheck Protection Program designed to assist small businesses. Upon receiving the funds, the man purchased a Lamborghini sports car for $318,000.00. In another U.S. case, a man is serving a 41-month prison sentence for defrauding the government of over $850,000, which he used to obtain plastic surgery, a weight loss program, and jewelry (U.S. Department of Justice, 2022).

In the 1970s, several studies examined the effects of a consistent, extended guaranteed income. Some of these programs tied the level of income support to the family or individual's financial status. In contrast, others provided payments that did not depend on earnings. These studies are subject to several caveats. The supplemental income was limited in quantity and duration in these applied studies (Calnitsky, 2020). These quasi-experiments also examined a minimal number of variables that could be related to physical and mental health, some of which may only have indirect links to these outcomes. In Dauphin, Manitoba, households that received supplemental income demonstrated reduced hospitalization rates. There were also suggestions that rates of mental health conditions may have been reduced with income support (Forget, 2011). Finland has recently conducted a study providing basic income and found that employment outcomes, health, and psychological well-being were positively associated with support (Hensher, 2020). Recent research with Canada's Metis community examined the effects of the Healthy Baby Prenatal Benefit Program (Struck et al., 2021). Pregnant women, generally of lower income, received up to approximately $70 per month during the third and second trimesters of pregnancy. The results were mixed. Mothers receiving the cash grant had improved birth outcomes and their children had higher vaccination rates. However, the program was inexplicably associated with elevated rates of large-for-gestational-age infants and greater neonatal readmissions within 28 days of birth (Struck et al., 2021).

Cash transfers related to COVID-19 have recently occurred in several countries worldwide. In the United States, income support was provided. The CARES Act included a $600 weekly Federal payment in unemployment compensation and extended the unemployment support period. A recent study found that receipt of unemployment insurance benefits was associated with reduced delay in receiving health care and also was associated with a reduced prevalence of depression and anxiety symptoms (Berkowitz & Base, 2021).

In addition to extended unemployment support, stimulus checks—typically around $1400.00—were sent to most Americans. Cooney and Shaefer (2021) found that in contrast to expectations, the average credit score in the United States increased during 2020 and 2021—most likely because of income support. Research on CARES stimulus checks' impact on health is limited to date. A recent study found that economic impact payment was not associated with improved mental health but was associated with enhanced physical health and decreased alcohol use (Tsai et al., 2022). However, multiple studies indicate that mental health was deteriorating during the pandemic, and it is certainly possible that a one-time stimulus check was not enough to offset this trend. More troubling are data suggesting that persons with psychiatric or substance use problems were less likely to have received stimulus checks (Tsai et al., 2022).

Another United States income support program during the pandemic was the Child Tax Credit (CTC) Plan, in which families received a monthly check for $300 for every child under the age of six and $250 for every child aged 6–17 years. Cooney and Shaefer (2021) tracked "Material Hardship," a composite that included employment status, regular income, savings, food security, and mental health. The availability of stimulus income, CTC, and extended unemployment support were associated with reduced "material hardship," with food security being particularly impacted by the presence and withdrawal of income support (Cooney & Shaefer, 2021). After the additional employment assistance expiration and the elimination of monthly CTC payments on February 22, the material hardship index for adults with children increased while remaining reasonably stable for adults without children. In contrast to means-tested financial support, a universal assistance approach may reduce the stigma associated with programs directed to the poorest segments of society.

From Rawls' social justice perspective, since COVID more strongly impacted the least advantaged, they should be given priority for any COVID-19-related financial assistance. For example, a government-based aid system in the Philippines was supposed to help the most economically disadvantaged. However, some citizens argued that it was not going to those most in need. In addition, like the business support provided in the United States, the *Ayuda* program was influenced by corruption (Gozum et al., 2021). Because of COVID-19 restrictions on mobility in the Philippines, the least advantaged were most strongly affected by the resulting economic downturn (Gozum et al., 2021).

In sum, while income support and guaranteed employment appear promising as programs to improve psychological well-being and physical health, the evidence is not currently present to make a strong case for national legislation for these programs to be permanent. Economic data from the pandemic period and its immediate aftermath are still being analyzed. However, it is hoped that, in contrast to the early studies of income support, future research will include multiple measures of social well-being and physical and mental health.

International Governmental and Social Care Response

At the national level, one reason that has been suggested for the lower GDP devoted to health care in many European countries compared with the United States is a well-established network of social care, including housing, child care, and unemployment support (Dutton, 2021). However, more recently, in some European countries, there has been a movement to privatize many social safety net services. In Sweden, considered a liberal democracy with a broad, cradle-to-grave set of government social services, the last 30 years have witnessed "new public management reforms (NPM)," intending to streamline and reduce benefits while introducing a market orientation into the public sector (Sörensen, 2020).

In some countries in the Global North, COVID-19 revealed inefficient, poorly integrated health and social care systems. For example, Sörensen (2020) described what COVID-19 revealed in Sweden: "a decentralized and fragmented system of health and social services, including the care of older people." In Sweden, governmental agencies at the community, regional, and central levels would optimally share responsibilities and demonstrate transparency in policy-making and decision-making processes. Concerning COVID-19, transparency was absent, with a corresponding failure to engage experts such as scientists, government administrators, representative citizens, and behavior change communications experts (Sörensen, 2020). A similar fragmentation occurred in Britain's COVID-19 responses to the homeless population. Since social distancing was required, shelters could not house as many people. As noted in an earlier chapter, there were suggestions that homeless persons were less likely to develop COVID if they slept on the streets rather than in organized shelters (Guise et al., 2022).

A report focusing on the World Health Organization's response to COVID-19 cited several problems that led to increased cases and deaths. The Independent Review found that only two-thirds of countries had the necessary legislation and funding to address a health crisis. Major criticism was directed to a policy that International Health Regulations had to be met before the WHO Director-General could act. The report suggested that a month was lost because of policy issues. The WHO report also cited the disparate vaccine availability between countries in the Global North versus those in the Global South—an indication of inequity.

The Lancet report (Sachs, et al., 2022) raised similar concerns. It also noted the delayed response by WHO. Specifically, the report also cited WHO's delay in recommending face masks for social settings—the announcement did not occur until well into April 2020. The Lancet report noted the pattern of social media disinformation as well as the influence of national elections on national leaders' responses.

Public health became politicized in several countries, including the United States and Brazil. Ministers of health and agencies such as the Centers for Disease Control were often controlled by government leaders who did not want "bad news" publicized on their watch (Sachs et al., 2022). The politicization of public health often stood in the way of developing and carrying out an evidence-based plan of reducing susceptibility and prevention through vaccination.

In contrast, the Japanese relied on the national government as the primary source of information. As a result, it was difficult for Japan to issue binding, enforcable legal directives such as mask mandates and stay-at-home orders. However, the government did issue a stay-at-home request. In addition, the government recommended several preventive measures similar to those in the United States, including social distancing, masks, avoiding crowds, regular hand washing, disinfecting surfaces, and avoiding touching one's face. A survey of many Japanese citizens found that those who reported greater trust in government were more likely to implement the recommended preventive actions. In addition, citizens reporting greater confidence in the government supported larger-scale interventions such as stay-at-home orders. Of interest, the association between taking preventative action and trust in government appeared to be stronger among younger adults (Gotanda, et al., 2021).

Child and Adolescent Mental Health

Before the pandemic, child and adolescent mental health were areas of growing concern. Twenge et al. (2018) reported an increase in depression and suicidality, including completed suicides, between 2015 and 2020. This increase was particularly pronounced among adolescent females. In particular, the effected suicides among 10- to 14-year-olds showed an unexpected rise (Twenge et al., 2018) and reportedly increased two-fold beginning in 2010. The study engendered controversy when it was suggested that there was an association between time spent on social media and the rise in suicidal behavior.

During the pandemic, the closure of schools and stay-at-home orders appear to have had an adverse impact on mental health. One of the early studies conducted in China reported exceptionally high rates of depression, with 43.7% of children and adolescents reporting clinically significant depressive symptoms and 37.4% reporting clinically meaningful symptoms of anxiety (Zhou et al., 2020). A German study followed children and adolescents through the pandemic. Before the onset of COVID, approximately 18% reported significant mental health symptoms (Krause et al., 2022). In May and June 2020, the rate rose to nearly 28.8% and 30.6% in December 2020 and January 2021. By fall 2021, restrictions were being reduced; however, rates of psychiatric symptoms remained high at about 28%. Anxiety symptoms were nearly twice as high as depressive symptoms in this cohort. The study's findings are consistent with reports from multiple countries suggesting increases in emergency room presentations for mental health issues in the later stages of the pandemic. In Australia, for example, youth and children seeking mental health services at community mental health centers or emergency departments declined by 50% at the outset of the pandemic but, by July 2020, exceeded pre-pandemic levels (Tedja et al., 2022). In addition, there was a notable increase in young patients with eating disorders in hospital emergency departments during this time.

The data suggest that child and adolescent mental health problems were likely pronounced before the pandemic—particularly among females. However, removing the structure of the school day (and week), including social interactions and academics, may have exacerbated mental health issues among young people who may have been able to cope when all of these predictable structured activities were in place.

The World Health Organization reported that globally, clinically significant anxiety and depression increased by 25% during the pandemic. While clear-cut data on trends are not yet available, some evidence suggests that the reduction in COVID-19 cases has not been associated with a parallel decline in mental health conditions (Kuehn, 2022). The pandemic has increased public and political awareness of the significance of psychiatric problems. In a recently released report, the *World Mental Health Report: Transforming Mental Health for All,* WHO reiterates the high economic cost of mental illness, increasing from $2.5 trillion in 2010 to a predicted $6 trillion by 2030. In a 2013 report, WHO recommended a continuum of mental health treatment and emphasized primary care settings as a venue to address the pervasive problem of inadequate psychiatric care. As of 2020, only 20% of countries had achieved this objective (Kuehn, 2022).

From a financial and humanitarian perspective, addressing child and adolescent mental health aggressively could have substantial benefits. Evidence is clear that most adults with chronic psychiatric conditions exhibited problems before entering adulthood. The level of mental health needs among the younger population is unlikely to be met by conventional outpatient and inpatient services; internationally, qualified child and adolescent mental health providers are scarce. However, in the United States, providing mental health services in the schools has become more common in recent years. In addition, while controversial, courses on positive mental health before high school are consistent with a primary prevention strategy. On a larger pedagogical scale, positive psychology curricula have been implemented in some school systems. Seligman, pointing to the worldwide rise in mental health problems, suggests that introducing children to concepts such as character strengths, gratitude expression, and coping skills in primary school can inoculate children against depression and anxiety in later childhood and adolescence (Norrish & Seligman, 2015).

Vaccine Hesitancy

The significant number of citizens who refused vaccination for themselves or their children in countries such as the United States is concerning. While many public health officials described vaccine hesitancy as a matter of inadequate knowledge, the anti-vaccination position appears to have deeper roots.

For some individuals, vaccine opposition appears to be a single domain issue. Among this group, those against vaccination believe that immunity acquired through exposure is more natural or that vaccines can cause direct harm. However, as the study linking anti-vaccine beliefs to distrust of law enforcement in the African-American community (Rosenthal et al., 2021) suggests, anti-vaccination beliefs may be part of a broader belief system. In addition to the distrust in government and the medical community, the anti-vaccination belief system has been incorporated into one's identity (Goldenberg, 2021). Support for this perspective comes from Hornsey et al. (2020), who examined associations between anti-vaccination beliefs and several conspiracy theories. These included: "conspiracies surrounding the assassination of President John Kennedy, the death of Princess Diana, the existence of a New World Order, and American government's knowledge of the 9/11 terrorist attacks" (Hornsey et al., 2018, p. 310). Anti-vaccine attitudes were moderately correlated with belief in conspiracies, with the strongest association in countries of the Global North such as Germany, Canada, and the United States (Hornsey et al., 2018, 2020). There was also a modest association between reactance and anti-vaccine beliefs. Reactance is perhaps best described as a combination of an attitude and personality trait. Persons high in this characteristic portray themselves as non-conforming and tend to challenge authorities that dictate specific behavior as well as not follow social conventions (Moreira et al., 2021).

President Trump's open criticism of vaccines and some protective measures such as masks made these issues political. Trump's supporters also embraced many conspiracy theories, such as the Deep State. Even Sesame Street's Elmo became an object of derision that simultaneously united believers. Elmo's episode of being vaccinated elicited conspiracy narratives about his liberal influence on children. The commentators on the One America News Network noted, while outwardly seeming to be a positive influence, Elmo was secretly "woke"—apparently a latent condition that only emerged during the pandemic. Sesame Street was then criticized for seducing young children into a liberal agenda with Elmo as a groomer. The term "groomer" is noteworthy since it is commonly used to describe an adult setting up a child to be sexually abused. Indeed, "liberal progressives" had been using the show for some time to influence the next generation covertly. One commentator accused Sesame Street of not being "family friendly" and stated that the show should be considered "illegal." Liberals were surreptitiously putting Elmo to work, "pushing medical tyranny" (Media Matters, 2022).

When anti-vaccination beliefs are a core part of one's identity, the odds of changing attitudes around vaccination would appear reasonably daunting. However, both public health and clinical medicine are rising to the challenge. Within public health, social marketing is an approach to "sell" desirable health behaviors in a similar way as commercial marketers sell cars or cornflakes (Craig Lefebvre & Flora, 1988). Some research on social marketing of vaccination suggests that by targeting the values of those who are reluctant, receptiveness to vaccination may increase.

In addressing parental concerns regarding the HPV vaccine, parents appeared to be more receptive to a "traditional" parent's recommendation for vaccination. The spokesperson's message reflects a "hierarchical worldview" (Goldenberg, 2021, p. 55) that was designed to reduce the vaccine's association with sexuality (Kahan et al., 2010).

An Australian public health agency developed a public service announcement campaign portraying non-traditional parents who would often be reluctant to vaccinate their children. The "I Immunize" project did not focus on the risks of avoiding vaccination but instead targeted values associated with these parents' identity (Goldenberg, 2021). Citizens of the region in which these ads appeared are particularly "eco-sensitive." Home births, organic gardening, and recycling are essential aspects of thei target group's lifestyle (Goldenberg, 2021). One of these ads features a pregnant woman identified as a local resident stating, "I use cloth nappies, I grow vegies, I immunize" (Goldenberg, 2021, p. 61). Another ad features a local woman, "Leela," breastfeeding with the caption "I breastfeed, I use homeopathy, and I immunize" (Goldenberg, 2021, p. 62).

From the perspective of social norms, the ads convey the message that one can be a parent who values a "natural"and eco-friendly lifestyle and still believes in vaccinations (Goldenberg, 2021).

As discussed earlier, most major medical societies discourage physicians from "firing" patients from their practice who do not accept routine vaccinations. Several approaches to counseling parents or vaccine hesitant patients use variations on Motivational Interviewing (MI) (Breckenridge et al., 2022). Rather than educating patients and trying to rationally convince them of the harms associated with vaccine avoidance these strategies encourage parents or patients to explain the reasoning behind their reluctance and for the health care provider, in a non-judgmental tone, to verbally reflect parents' or patients' concerns.

The American College of Obstetricians and Gynecologists has put together a series of videos demonstrating how to discuss vaccine hesitancy with patients. Cullen et al. (2022) describe an innovative approach for teaching these interview techniques to medical students, nurses, and allied health personnel using improvisational theater. The audience, health care professionals who are not "center stage," can stop the dialogue and offer commentary and alternative approaches to the patient-focused discussion. An example: Vaccine hesitant "patient": "I don't want COVID to get in my body and mess with me. I don't want to change my DNA." Health care provider's "improvisational "response": "Yes, I'm curious, where have you been getting your information from? Or is there anything I can help share with you in terms of the information that I have about the vaccine"(Cullen et al., 2022, p. e-2). A key element in using MI is that before the information is provided, the clinician asks the patient if they are interested in hearing it or obtains verbal permission beforehand. This technique, a core part of MI, addresses reactance in that the patient controls whether the information is provided.

Changes in Health Care: Education, Training, and Practice

As this volume shows, responding to COVID-19 requires expertise in multiple disciplines, including virology, epidemiology, clinical medicine, pharmacology, social services, ethics, behavioral science, education, economics, and public administration. All of these fields have contributed to the response to the pandemic. For example, mental health professionals have been educated in virology and epidemiology, physicians have become conversant with the public health approach, and economists have turned their attention to the impact of lost wages in the near term and the loss of education on earnings in the future. It is hoped that one positive benefit of the pandemic is to encourage more cross-disciplinary education based on the recognition that successfully responding to a "hyper-emergency" requires knowledge from many fields. In the case of COVID-19, laboratory scientists successfully developed a vaccine in historically record time. However, sociological, political, and psychological factors strongly influenced the public acceptance of the vaccine. The authors' principal academic field is psychology. However, psychologists' ability to be helpful during a pandemic will be enhanced with social epidemiology, public health, bioethics, and political science knowledge. This section examines several aspects of health care that had previously received less attention, such as "Crisis Standards of Care," the ethics of treatment allocation, or pre-existing practices that rapidly developed and became established during the pandemic, such as telehealth.

Crisis Standards of Care: Protocols, Training, and Education

Hick et al. (2021) distinguish between three levels of medical care: conventional, contingency, and crisis. Conventional care is the usual standard and generally assumes adequate resources in terms of staff, equipment, and hospital beds. Contingency care may involve some adaptation of routine care, such as housing post-op patients in a different unit or using emergency care “boarding” when the hospital psychiatric unit is at capacity. Crisis standards of care occur when resources are inadequate given the demands for care. In crisis care, that there will be more patient deaths because optimal levels of care cannot be provided. While there is a gradient between conventional and contingency care, most health care providers view crisis levels of care as discontinuous with the other two sets of standards (Hick et al., 2021).

In the Global North, shifting to crisis standards of care is relatively rare. It may occur after a natural disaster or in the face of an acute staffing shortage. However, many practicing health care professionals have not been formally trained in the crisis protocol. Hick et al. (2021) observed that during crisis care, there is a risk that triage and level of care decisions are made based upon incomplete information about treatment resources or “implicit” decisions may be made about medical futility without consultation. In these situations, a central physician or triage team should have ongoing knowledge of the patient census and when a rationing decision may be likely. Rather than directly following a patient’s or their family’s request for interventions with a low probability of success, such as CPR, physicians should be trained to discuss the consequences and likely outcomes of interventions such as CPR or ventilator support with patients’ families. Hick et al. (2021) recommend that during crisis care, hospital administrators provide information on an ongoing basis about the availability of specific supplies, trends in illness incidence, and, as needed, information from outside agencies.

In addition to optimizing the health care workforce during a crisis, suspension of customary regulations, such as state-specific licenses, can temporarily allow for an increase in a region’s health care workforce. In addition, temporarily allowing cross-national health care practice can also be beneficial. Another type of flexibility is when physicians temporarily practice outside of their specialty. For example, during the peak of the pandemic, dermatologists were treating COVID patients.

Some of the issues involved in providing optimal crisis care are the province of hospital administrators and local, state, and national governments. One of the critical problems highlighted by the COVID-19 pandemic was the absence of cooperation across government levels, offices, and agencies (Wright, 2021). For example, the role of the U.S. Centers for Disease Control in relation to the president’s medical advisors, and state health departments was a source of considerable tension and conflicting communication during the pandemic. As discussed earlier, the U.S. President, along with the chief executives of some other countries, did not model or strongly encourage infection control measures such as mask wearing and distancing

The reality of limited resources is also a key factor to be addressed when moving to a crisis care mode. Rationing protocols should be flexible based on risk factors for severity and lethality of any new infectious agent. As described in this volume, unless the process is random, such as a lottery, segments of the population will be de-prioritized for life-sustaining care. While this reality guarantees dissatisfaction among some, a transparent, close-to-consensual set of standards involving all stakeholders may elicit fewer vocal protests.

There have been relatively few systematic approaches to developing a set of standards at the community level. An exception in the United States is the state of Maryland that held a series of community forums to establish a policy for allocating care in the face of limited resources. Over 5 years, multiple citizen groups met to address questions about who should receive ventilators, blood transfusions, dialysis, and surgery in the case of an epidemic or mass casualty event. The foundation for this process was the recognition that citizens would be directly affected by an allocation policy, and in a health crisis, public trust was particularly important (Daugherty-Biddison et al., 2017). The final report, published in 2017, included guidelines similar to those employed for COVID-19. Relevant dimensions included the patient's age, long-term and short-term survival prognosis, and social value. A summary of the citizen respondents' perspective on social value is as follows: "... participants worried that emergency allocation decisions would replicate existing inequities (e.g., insured vs. uninsured, urban vs. rural), and some expressed concerns over certain perceived 'undesirable' groups (e.g., prisoners, undocumented immigrants) receiving resources before 'more deserving' others"(Daugherty-Biddison et al., 2017, p 6). The final report recognized that there were situations that were morally ambiguous such as removing a ventilator from one patient to give to another patient with a better chance of survival. In addition to soliciting community input, this process also made those involved more aware of the ethical dilemmas involved and the underlying value-based dimensions of crisis care decision-making (Daugherty-Biddison et al., 2017).

Telehealth and Online Medical Care

While telehealth had not really "caught on" before the pandemic, this medium appears to have become rapidly and surprisingly popular among physicians and patients. A recent survey reported that 90% of physicians said telehealth improved patient access and communication (Wantuck, 2020). Further, most patient concerns could be successfully addressed with one telehealth encounter. Another technological innovation that was present pre-pandemic was the establishment of online patient portals. These allow for relatively efficient prescription refills without having to make an office visit and in many cases, recent laboratory test results and blood pressure readings. Wantuck (2020) also suggests that for common conditions with consistent symptoms such as a urinary tract infection or a streptococcal infection, diagnosis via telehealth is likely more efficient than an office visit.

While telehealth does pose some possibilities for decreasing health care disparities through accessibility, the abrupt shift to online health care with COVID-19 did not allow adequate time to address the digital divide. For example, among pediatric patients during the pandemic, telemedicine visits were more likely to be missed by those from zip codes associated with lower incomes. This pattern was present across multiple racial and ethnic groups. While overall attendance was improved with telehealth, those of lower income did not benefit from the innovation (Brociner et al., 2022).

While the frequent use of telehealth is likely to remain post-pandemic, the question remains as to which types of health care visits, including mental health, are better suited to telehealth. Additionally, along with the growing use of personal medical online portals for patient information, the continuing disparities in income impacting access to tele-medicine are concerning. Finally, some segments of the population may not be able to reap the benefits of this new technology. Older patients and recent immigrants with limited English proficiency may not be a good fit for patient portals or telehealth.

One potential approach to this dilemma is the use of health care navigators. When the Affordable Care Act was implemented, many people trained as health care navigators assisted those with enrollment who were not comfortable with online technology (Searight, 2018). A similar strategy on a larger scale may be helpful for patients new to telehealth. In addition, simplification of online technology may assist in reducing the digital divide. For example, for older adults not comfortable with traditional computers, several companies have developed computers that only include programs such as e-mail or Zoom and simplify log-in processes.

Finally, the critical question is not “Is telehealth effective?” but “Under which circumstances is telehealth effective?” In assessing symptoms of major depressive or generalized anxiety disorder, a televised visit via Zoom can likely occur with few limitations. However, it remains to be seen whether an evaluation of acute psychosis can be as thorough without in-person, face-to-face contact.

Changes in Clinical Decision-Making

COVID-19 provided unique challenges to the medical and nursing professions. Providing health care under crisis conditions changed standards for decision-making and produced a cognitive set focusing on efficient and essential medical treatments with the greatest potential for benefit. A recent study of end-of-life care in Britain exemplifies this subtle change in medical decision-making. After providing health care in the context of the pandemic‘s crisis standards, some physicians reported shifts in their reasoning. They indicated that they were more likely than pre-pandemic to unilaterally designate patients as having “do not resuscitate” (DNR) status. Physicians also reported that after their experience with the pandemic, they were less likely to send patients to the intensive care unit. While the physicians indicated that they were less likely to escalate treatment, they were more likely to recommend palliative care. The physicians surveyed indicated that COVID-19 had changed their views on do-not-resuscitate orders and palliative care. These new perspectives were maintained as the number of COVID-19 cases declined. Even after the acute stage of the pandemic, NHS physicians indicated that resource limitations often influenced their treatment decisions (Chang & Matthews, 2022). Finally, in keeping with the protocols for allocating intensive care unit beds and mechanical ventilation during the pandemic, clinicians indicated that they were more likely to use the frailty score and the patient's age in making these decisions (Chang & Matthews, 2022).

Conclusions

As psychologists, one of the significant lessons we learned from COVID-19 was the limited perspective provided by our discipline's focus on the individual. It became evident that issues ranging from compliance with social distancing, vaccine hesitancy, increased unemployment, health care disparities, and income inequality were significant predictors of both physical and psychological consequences of COVID-19. It is hoped that the pandemic can inspire greater interdisciplinary collaboration and reduction of professional silos. To do so will require significant changes in health and mental health education. By broadening our perspective to include fields such as epidemiology and public health, we will likely have a richer understanding of the larger forces influencing individual lives.

Finally, there is concern that if/when the pandemic becomes endemic in the general population, public health's attention and funding will return to its previous underfunded state. In recent history, funding and interest in public health have risen with a crisis and then receded. For example, soon after the 9/11 attack in the United States, there were instances in which potentially fatal anthrax was sent to government leaders. This threat thrust public health into the spotlight and prompted additional government funding. Historically, by the time COVID-19 emerged, many states, counties, and municipal public health departments were operating with reduced personnel and outdated equipment. Hopefully, the emphasis on population-level well-being will continue after the pandemic, and public health will receive ongoing, adequate government support.

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