GLOBAL HEALTH

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Abstract

This chapter aims to provide an overview of the history and key issues in the field of global health, highlighting strategies that are being employed to improve health around the world. It will explore the role of technologies and how their development

has impacted on human health, the interplay of international politics over time and ethical considerations that arise in the context of global health interventions, especially foreign aid. Ultimately, this chapter will serve as a summary of where we have been and where we may be headed in the near future, and as a call to action to all those who care about health to work collaboratively towards a world where good health–not just good health care–is a reality for all.

Keywords:

global health, health care finance, public health, tropical health, health policy, public health history, foreign aid, international health, health technology

1. Introduction

The field of public health has become important in recent years. Within this field, global health has emerged as a critical area of focus, given the interconnected nature of our world and the widespread impact of health issues across national borders.

The need for global health has never been more evident. While significant progress has been made in reducing the burden of disease in many parts of the world, millions of people continue to suffer from preventable and treatable illnesses, and the increased interconnectedness and interdependence of people around the world brings into increased focus our wish for all people to enjoy good health, not just our own families and close neighbours. Health inequalities exist both within and between countries, with marginalized communities and lower income populations often experiencing the worst health in a given community. Meanwhile, the re-emergence of novel infectious diseases and the threat of pandemics pose a global challenge that requires protection of health, cooperation and collaboration within and across borders.

This chapter aims to provide an overview of the history and key issues in the field of global health, highlighting strategies that are being employed to improve health around the world. It will explore the role of technologies and how their development has impacted on human health, the interplay of international politics over time and ethical considerations that arise in the context of global health interventions, especially foreign aid. Ultimately, this chapter will serve as a summary of where we have been and where we may be headed in the near future, and as a call to action to all those who care about health to work collaboratively towards a world where good health–not just good health care–is a reality for all.

2. Significant events that have promoted the development of global public health

The Industrial Revolution, which took place between 1820 and 1840, was a significant turning point in history with the transition from hand production methods to machine manufacturing. During this period, the world witnessed the invention of practical technological and architectural innovations, such as the steam engine, which allowed for factories to be located beyond the banks of rivers and hydropower. At the same time, the revolution introduced many new challenges, including an unprecedented rise in the human population, sanitation problems in areas where factories were located, deterioration of living conditions for workers, and the failure of nation-states to resolve these challenges. At the same time, the development of transportation due to the inventions of the steamship (1810) and railway (1830) placed significant pressure on national quarantine systems, paving the way for contagious disease transmission around the world.

2.1 Infectious diseases

In response to an ongoing cholera epidemic, in 1851 the Government of France pioneered in initiating and organizing the first of 14 International Sanitary Conferences at the time attended by representatives of 12 countries to provide guidelines for controlling the spread of disease, particularly cholera, plague, and yellow fever (Feldbaum et al., 2010).

Since governments that participated had previously encountered transboundary disease transmission, quarantine was featured at the center of the discussion. Despite the failure of most of the early conferences to reach agreements about quarantine for fear of disrupting trade and inhibiting freedom of movement, 1851 could be thought of as the year when the first international negotiations on infectious disease and public health took place. At this time, the mode of infectious disease transmission had not yet been widely understood.

The period that followed (1851 to 1938) did ultimately produce significant infectious disease control treaties, and from 1851 to 1951 some of our modern disease control agencies opened in their early forms: the Pan American Sanitary Bureau (1902), the International Office of Public Hygiene (1907), the League of Nations' Health Organization (1923), and the World Health Organization (WHO; 1948).

2.2 International drugs trade and public health

Recognizing the potential for profit from trading in opium between 1839 and 1942, British forces fought a war with China, and China eventually gave permission to import the opium produced in British colonies, especially India. The subsequent victory in the conflict opened a lucrative trade, resulting in widespread opium addiction in China (Bhopal et al., 2018).

Facing this problem, the Chinese government of the time proposed an agreement to end opium trading. The British refused, and this second "Opium War"

resulted in more than a million square miles of Chinese territory ceded to Russia in negotiations and 156 years of British administration in Hong Kong, ending in 1997. China was not the only country influenced by the opium trade during this period. Sailing ships further facilitated the development of economic links between Europe, the Americas, Africa, and Asia, enabling the expansion of the opium trade to many countries (Bhopal et al., 2018). The world grew concerned over the social and health harms caused by narcotic drugs in the latter half of the 19th century, and the International Opium Commission was convened in 1909 in Shanghai, representing the first international conference to take steps towards global drug inhibition.

2.3 Occupational safety and health

The Industrial Revolution of the 19th century also resulted in increased awareness about the health of the workforce and their treatment by employers. Lack of job security, work under unsanitary conditions, and long working hours to earn meagre wages for living, not to mention exploitation and abuse in the workplace, all became major concerns (Knapp, 2000). This phenomenon brought about an effort to set international labor standards to assure workers' rights and maintain social and economic justice. In 1919, the International Labour Organization, a United Nations agency, was founded to bring attention to these issues and to improve the circumstances of working people (Sheikh et al., 2016).

2.4 Transboundary water and air pollution

During an outbreak of the cholera epidemic, Soho London in 1854 witnessed the death of hundreds of people. Facing this problem, John Snow, an English physician, doubted the accuracy of leading hypotheses about the causes of the cholera outbreak. He noticed a relationship between cholera and contaminated water supply using spatial mapping and simple measures of association between potential exposures and

development of the disease, and from these he proposed a water-based means of cholera transmission (Ruths, 2009).

As legend relates, soon after the pump was disabled, the incidence of new cholera cases in the area quickly waned (Bhopal et al., 2018). Snow's findings were some of the first documented in the West to use "observational and spatial" methods in epidemiology, and he has been considered to be the "father of field epidemiology" (Ferrie, 2012). Uptake of Snow's views on the potential for infectious disease transmission via water were slow to take hold, but in part due to his work, later 19th and early 20th centuries water sources were often regulated in Europe and included prohibition of polluting (Birnie et al., 2009). A popular pub house carrying John Snow's name and his legend still stands nearby in the London neighborhood of Carnaby, Soho, at 39 Broadwick Street.

A little later on, in 1939, on another continent, the Trail Smelter Arbitration occurred. In this case, a lead and zinc smelter located in mineral rich British Columbia (Canada) and owned by the Consolidated Mining and Smelting Company began emitting smoke that crossed the international border with Washington state (in the United States), causing significant damage to forests and crops and distressing nearby residents. Affected landowners complained and demanded that reparations be made. As an agreement between residents and the company could not be amicably reached, the case continued to a tribunal in 1941 thereby highlighting a need for further cooperation in tackling public health threats by establishing principles in environmental laws around transboundary pollution (Kuhn, 1938; Wirth, 1996). This case also stimulated the development of an important pillar of public health, known as health "protection" (Ghebrewet et al., 2016).

3. Modern Politics and Global Health

As a consequence of the United Nations meeting in 1946, many countries from the north to the south began collaborating, giving birth to the WHO and marking the beginning of dealing with the global health problems in a globally coordinated way. Amongst the main functions of the WHO include discussions of health equality worldwide, support for developing nations, and the strengthening of national health care systems. In the early days of the WHO, the organization focused more on infectious diseases than on primary health care provision. After the Cold War, economic factors combined with the demand for health services led to further regulation and monitoring of health care practices around the world (Donaldson & Rutter, 2017).

The Cold War caused many countries to fall into financial difficulties, leading to insufficient payments for domestic health and sanitation activities, causing some of the world's most severe health delivery problems.

The Alma-Ata Declaration was drafted in 1978 as a tool for achieving health care for all and highlighting on the importance of health in world development. Besides reaffirming health as a human right, the Alma-Ata Declaration focuses on health equality, the role of health in social-economic development, and the importance of primary health care. Although the manifesto highlighted the importance of health and linked health to economic development, some critiqued the manifesto's goals as too broad, not specific, and unrealistic. Thus, to work towards achieving health for all, world organizations would need more specific goals and conventions in the coming years.

When former colonial powers had, in the past, provided financial subsidies to their former colonies during dire circumstances, these have sometimes been received

with contention. With a high likelihood of domestic economies collapsing in developing countries, former colonial powers have been in a position to take advantage of this to create neo-colonies.

To assist emerging nations with health problems in a way that would, in theory, be unrelated to politics, many non-government organizations were formed to address medical needs. The birth of the non-government organization (NGO) ushered in an era of investment in health services, which grew rapidly during and after the 1990s via NGOs, large private donations, and foundations. At the same time, highly respected leaders in global public health such as the late Dr Paul Farmer warned against and presaged that these ungoverned organizations could undermine necessary developments in public health at a national level—too big and too costly usually for any NGO or donation to maintain, however charitable. His early concerns about fairness and sustainable development have widened and are now currently important considerations in global health and in developing countries generally.

4. History of Global Public Health as a Concept

4.1 Development of Global Health

The term *global health* increased in popular usage in the 1990s, gaining further prominence rapidly after 2000 when the concept of millennium development goals (MDGs) started gathering momentum worldwide (Holst, 2020). Before the popularity of the term *global health*, many similar terminologies and ideas about health for humanity fit with different periods of world history. Global health could be thought of as having started during the colonial period of history as "tropical health." A recent notable reanalysis of the origins of the field of epidemiology by historian Jim Downs (*Maladies of Empire*; 2021) views epidemiology itself as having grown up as a result

not of brilliant social and health analyses by the likes of the legendary John Snow but more as a science aiming to protect colonial investments, including those involving human slavery (Downs, 2021).

This is a relatively new interpretation of the history of epidemiology and therefore of global health that warrants attention and further discussion, especially when any human population is considered from a top-down, profit-oriented perspective as has been done in recent years during the COVID-19 pandemic.

During the 19th century, the study of tropical health became a trend in colonial regions worldwide. Universities initiated research programs in epidemiology in the colonies, thereby demonstrating an interest in protecting health, whatever the motivation. “Tropical health,” though, faded in prominence as it did not solve global issues and because all regions, not just the tropics, proved to require public public health strategies that worked well in any increasingly interrelated and equality-focused world.

After tropical health, *international health* became a popular term, especially in the United States (Holst, 2020). The rapid development of economies and trade also caused epidemics to extend beyond regions to become more international in nature. Trading activities became a bridge to spread diseases to different countries and territories, and it is difficult to control an epidemic internationally without collaboration.

4.2 The Introduction of Millennium Development Goals and Sustainable Development Goals

4.2.1 Millennium Development Goals and Global Health (2000–2015)

The MDGs were earmarked and agreed to by the United Nations to be achieved by 2015 (WHO, 2018). They were created in an attempt to combat extreme poverty by

halving it, to stop HIV from spreading, and to make primary education universally accessible to all (United Nations, 2015). The following table shows an excerpt of the health-related MDGs 2015: Rwanda performance and contributing factors (Abbott et al., 2017).

Millennium development goal	**Target**	**Progress on specific indicators**
Goal 4: Reduce child mortality	Reduce by two thirds between 1990 and 2015, the under-five mortality rate	• Under 5 mortality decreased by 47% to date (in 2012, 6.6 million children under 5 died; majority of deaths occur in world's poorest regions). o Neonatal mortality has fallen by a third, but proportion of deaths in first 28 days of life has increased. o Proportion of children covered by one dose of measles vaccine increased from 72% to 84% (from 2000-2009); no change past few years. Globally 21.2 million infants

		unvaccinated in 2012.
Goal 5: Improve maternal health.	Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio Achieve, by 2015, universal access to reproductive health	• Maternal mortality ratio fell by 45% between 1990 (380 deaths per 100,000 live births) and 2012 (210 deaths per 100,000 LB). Proportion of deliveries attended by skilled health workers increased from 56% to 68% in developing countries. o 83% of women in developing countries who see a health worker once in pregnancy increased to 83%, but only 52% have the 4 recommended visits. o Births to adolescent girls have declined - e.g. from 88 to 50 births per 1000 girls in South Asia, but still 117 births per 1000 girls in sub-Saharan Africa, and 76 in Latin

		America/Caribbean. • Unmet need for family planning declined from 17-12%.
Goal 6: Combat HIV/AIDS, malaria and other diseases	Have halted by 2015 and begun to reverse the spread of HIV/AIDS Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases	• Number of new HIV infections (adults) declined 38% between 2001 and 2013. o In sub-Saharan Africa, 39% young men and 28% young women (aged 15-24 years) have comprehensive knowledge of HIV. o 12.9 million people globally received anti-retrovirals in 2013. o Malaria mortality declined 429% between 2000 and 2012. o 87% of 6.1 million newly diagnosed TB patients received therapy.

4.2.2 Sustainable Development Goals (SDGs) and Global Health (2015–2030)

In a collaborative venture with governments, international agencies, and other civic groups, the United Nations committed to stimulating prosperity by agreeing upon strategies to promote economic growth and redress global inequalities in education, health, social welfare, and job markets. A major focus was also aimed at galvanizing momentum in tackling climate change. As a result of these efforts, a the 17 Sustainable Development Goals (SDGs) could be seen as an evolution of the MDGs, intended to serve as a more sustainable roadmap to ending poverty, protecting the planet, and ensuring peace and prosperity for all people. The goals are interconnected and cover a range of areas, including ending poverty and hunger, promoting sustainable agriculture and clean energy, reducing inequality, ensuring access to quality education and health care, and promoting gender equality and inclusive economic growth (Bhopal et al., 2018).

5. The "Global" part of Global Health

5.1 Measuring progress in Global Health

One of the first things that is needed is to agree on what to measure and how to ensure these are comparable across all the nations and population groups of the world so that there will be a fair and standard way of measuring progress, or a lack of it in any given community. In public health, these are commonly known as "outcomes."

A few key "outcome" measures of global public health around the world (Hyder et al., 2012) are described here.

5.1.1 Life expectancy

Life expectancy is one of the world's most commonly reported health outcomes. It estimates a number of years that a person will live, based on mortality rates at the time of that person's birth. Data are available on various international agency websites or dashboards to show each country's metrics, often in the form of league tables to highlight countries with the highest and lowest life expectancies. Wars, famine, and disease burden can cause these to stagnate or decline, but for most of this century, in most countries, life expectancy has generally continued to rise.

5.1.2 Child mortality

Child mortality is an estimate of the probability that a child will not live beyond the age of 5 years, based on mortality rates at the time and place of his or her birth. An analysis of mortality for children provides essential information regarding aggregate health in a country because critical health-related challenges characterize the first years of life. Consequently, life expectancy increases substantially conditional on surviving the first years of life. Indeed, an essential part of a nation's gains in life expectancy at birth is precisely due to significant reductions in child mortality.

5.1.3 Burden of disease

Burden of disease metrics are used to assess the detrimental impact of each known disease and the associated risk factors. These data are collated on disease incidence, how it distributes within populations, and the way it trends (Merrill, 2021). The cumulative disease burden is the total of its mortality and disability.

5.2 Five metaphors about Global Health and Global Health policy –stopped here

Policymakers use metaphors to comprehend complex policy trade-offs based on a few consistent strategies and principles (Lau & Schlesinger, 2005). Five leading "metaphors" in global health have been identified by Stuckler and McKee (2008)

from the London School of Hygiene and Tropical Medicine, namely global health as foreign policy, global health as security, global health as charity, global health as investment, and finally global health as public health. These metaphors help public health researchers to understand this emerging area and to have clarity about the motivations behind the activities and initiatives of donors and nations that engage in global health work around the world (Stuckler & McKee, 2008).

5.3 Global Health as Foreign Policy

The relationship between global health and foreign policy could be said to be based on four primary components: aid, trade, diplomacy, and national security (Feldbaum et al., 2010). For example, politicians may use global health policies as a tool to exert political influence or to create a positive worldwide reputation. States can, for example, forge alliances with countries with strategic interests to open markets for trade (Stuckler & McKee, 2008).

5.4 Global Health as Security

Global health policy also pays great attention to protecting citizens against the threat of communicable diseases, such as severe acute respiratory syndrome (SARS), influenza, multi-drug resistent tuberculosis (MDR-TB), and schistosomiasis (Stuckler & McKee, 2008). In many cases, they are diseases of emerging economies that pose a potential threat to the population of rich countries, but since COVID-19 this has of course changed. According to the WHO, health security has been placed at the center of national security, particularly implementing plans to prevent the transmission of diseases at borders, for instance, through epidemic control measures (Fidler, 2001).

5.5 Global Health as Charity

Charity in global health aims to provide global citizens with an equal opportunity to thrive regardless of their socio-economic status. Global health as charity's aim is

typically to save and improve the living conditions of people worldwide by focusing on preventing and treating treatable diseases for a maximum number of people (Syntia Munung et al., 2022). Given the often limited reach of charitable funds, it is necessary to have clear criteria in prioritizing those who receive this welfare to ensure fairness. Typically, mothers and children with issues of malnutrition, safe childbirth, and infectious diseases are prioritized (Stuckler & McKee, 2008).

5.6 Global Health as Investment

According to the WHO's Commission on Macroeconomics and Health, global health can be considered an investment, using health to maximize national economic development. The main focus of this goal is on young and working-age citizens, hence the importance of focusing on diseases such as AIDS, tuberculosis, and malaria, which can act as a roadblock to national economic development.

6. Global Health as Public Health

The last global health metaphor proposed by Stuckler and McKee (2008) emphasizes the importance of international efforts in tackling risk factors to reduce the worldwide disease burden. In this conception of global health as public health, continuous efforts are made to ensure that no communities are marginalized who have unique health needs. Public health is based on societal actions that aim to deliver better health outcomes and prolong life expectancy and to do so for minority populations in equal measure as for larger populations (Liamputtong & Rice, 2022).

6.1 Disparities in service and access

Developing countries encounter many challenges that impede them from providing their citizens with the most advanced health care systems, including a lack of trained health workers to provide a basic level of medical care as well as disease prevention

and inadequate monetary resources to construct modern public health facilities and infrastructures (Stapleton, 2014).

The “brain drain” phenomenon has exacerbated these significant differences between developed and developing countries. Brain drain in health care is when the under-remunerated and frustrated health care workers foresee the weakened health care system and accept recruitment offers to work in wealthier countries, which potentially provide them with high-quality living standards, better access to advanced technology, higher earnings, and more stable political conditions (Misau et al., 2010). The consequence of this phenomenon is a shortage of human resources in health care and, thus, a weakening of the health care system generally. Therefore, on one hand, governments in low-income countries invest in training health care workers with no value added in the long run. On the other hand, it is high-income countries who reap all the benefits as they have pre-trained health care workers being recruited into the services with huge savings made on training homegrown health personnel.

6.2 Foreign health aid

There is a growing recognition of China as a global health donor, especially in Africa with more than 200 health, population, water, and sanitation (HPWS) projects reportedly undertaken during the years from 2000 to 2012 (Daly et al., 2020; Grépin et al., 2014; Lin et al., 2016). These projects typically involve transferring lessons learned from Chinese domestic successes, for instance, malaria control and prevention, sending its medical teams to malaria-endemic countries, providing essential equipment and drugs, and building health care infrastructures (Grépin et al., 2014; McDade & Mao, 2020).

Since 2013, the Chinese government has increased its external investments through the Belt and Road Initiative, formally known as One Belt One Road, China’s

infrastructure development strategy to connect China with the other six main economic corridors of Asia and Africa. These “high-standard free trade areas” are expected to foster regional cultural exchanges through extensive international cooperation in various fields, including health care and traditional Chinese medicine (Daly et al., 2020; Organisation for Economic Co-operation and Development [OECD], 2018). To shed light on conflicting opinions regarding the motivational value of these investments, a qualitative interview has been conducted with local African and Chinese participants living in Tanzania and Malawi. They were broadly supportive and appreciated health aid from China. However, they shared common concerns about communication barriers and a limited understanding of priorities and expectations (Daly et al., 2020).

Health aid from developed to developing countries can be a gesture of goodwill to foster equity in providing health care worldwide, as concerns over the spread of disease due to globalization increase (Afridi & Ventelou, 2013; Twumasi, 1981). Despite the meaningful message of this gesture: lending a hand to developing countries in escaping the poverty trap, the efficacy of international health aid requires further attention and scrutiny.

6.3 Efficacy of distributing aid to regional areas

Firstly, it is crucial to understand three concepts: bilateral, multilateral, and bi/multi-lateral aid (Spicer et al., 2020). Bilateral is generally government-to-government aid, multi-lateral aid is generally government-to-local agency aid, and bi/multi-lateral aid is generally from a donor agency to a government or local agency. There are also many other public and private ways in which aid can be delivered, some of it difficult to monitor and track.

In health care, foreign aid includes construction of health facilities, training health care workers, providing opportunities for exchanges and cooperation, dispatching medical teams, and facilitating medicines and provision of medical equipment (Grépin et al., 2014).

The procedures and processes in monitoring the quality and appropriate use of the foreign aid and donations are complex jobs for donors. Equally, selection of the deserving recipient governments is also a convoluted process as there is need for the recipients to demonstrate "good governance" and low level of corruption in the process through to distribution of aid to intended recipients locally (Ali et al., 2019).

As an example of the complexities involved in global health aid, the *Economist* reported in 2016 about a case of aid gone wrong in Malawi. Of $1.17 billion in aid to Malawi 2012, around $300 million went missing, misappropriated from the treasury resulting in non-delivery to 17 million impoverished people living with HIV/AIDS (The Economist, 2016).

Health aid to developing countries is an essential source of public health funding. In low to medium income countries, health aid is a vital lifeline for public-funded health institutions and care services. In the case of Malawi, in the year of the scandal, foreign aid accounted for 28% of Malawi's gross national income. The concept became popular and increased significantly after the World Wars following concerns over the spread of disease due to globalization. Health aid also increased in the early to mid-1980s following the AIDS/HIV epidemic in sub-Saharan Africa. However, there is scepticism among those who believe that gifting to impoverished nations is disruptive to courses of development as it causes dependence on aid, and in many cases, the assistance fails to reach its recipients (Ali et al., 2019).

6.4 What is corruption?

Corruption is defined as the misuse of official authority for personal interest (Rodriguez et al., 2005), which raises questions about allocating aid to regional areas and whether global health aid is received as intended by donors. Poor governance of funds from recipient countries could lead to a failure to promote development and infrastructure and reduce the available funds (Botero-Rodríguez et al., 2022).

6.5 Health Ethics

Ethical standards are a set of acceptable rules that provide guidance on how humans interact in formal of professional environments (Bedeker et al., 2022). Although most ethical theories, principles, and concepts are universal, they tend to vary in the way they are applied in different cultures, religions, and geographical locations. For instance, the widely condemned practice female genital mutilation may still be acceptable and upheld in certain social groups, specific religions, and cultural beliefs. Some may argue that condemning this practice as a human rights violation may constitute a form of ethical imperialism. Others strongly support women and children who face the risk of being harmed through female genital mutilation. Another example is in Europe where euthanasia is legal in Switzerland as the ethical belief is that it is for the greater good whereas in the United Kingdom, assisting someone in terminating his or her life is a criminal offence. Global heath ethics were borne out of the need to develop practices to harmonize moral values when dealing with health issues that need coordinated action plans at a global level (Stapleton et al., 2014).

6.6 Health Care Finance and Economics

Financing is a core determinant of how health care systems are modelled and delivered to the public. Health care finance is made up of three fundamentals, which are finance generation and collection, funding distribution (including how services providers are remunerated), and subsidisation (Donaldson & Rutter, 2017). In most

countries, governments allocate tax-funded spending towards health care. The following are various funding structures for raising revenue for health care finance: out-of-pocket expenditure, voluntary health insurance, government spending, NGOs, and private corporations.

In global health, measures of consumption and health-related services and care are systematically evaluated as health spending. The amount of resources invested or spent in individual health care per person varies in each country (OECD, 2021),. In some countries health systems are market-driven with private organizations heavily invested in providing services with minimal involvement by the state except for regulating and licencing these providers.

In most low-income countries the health systems may deliver basic care due to a lack of government commitment towards health care finance. In many cases, there will be an alternative out-of-pocket funded health system, which may not be affordable to low-income communities. In the United Kingdom, a unique and universally tax-funded health system, which is accessible to all called the National Health System (NHS), has been in operation since the close of the Second World War. Most other high-income countries have a mixture of publicly and privately financed health care. No health care finance system is failproof due to various factors such as changing political trends, public attitudes, and levels of disease burden.

7. Conclusion and Future Directions

Global health addresses the health issues that affect populations around the world. It involves interdisciplinary collaboration, research, policy-making, and advocacy to improve the health of people worldwide. An on-going challenge in the field of global health is unequal access to health care and resources. To address these

issues sufficiently, further strengthening of social, economic and health care systems will be needed. The more we become socially connected, the more we can see how much further work needs to be done.

Another challenge is the re-emergence and spread of new infectious diseases, e.g., COVID-19. The global response to COVID-19 has highlighted the importance of global coordination in response to pandemics. It has also highlighted weaknesses in our ability to address future health emergencies, including those not directly related to infection disease such as climate change.

Global health efforts could further take into account the social determinants of health, factors that contribute significantly to health outcomes. In addition, efforts to promote health can be better tailored to the specific cultural, social, and economic contexts of the people they aim to serve. Global health is a complex and challenging field that requires collaboration and innovative approaches to improve health outcomes worldwide. Tackling global health challenges will be a worthwhile area of both work and study in the future as we work towards a healthier and more peaceful world.

References

Abbott, P., Sapsford, R., & Binagwaho, A. (2017). Learning from Success: How Rwanda Achieved the Millennium Development Goals for Health. World Development, 92, 103-116. https://doi.org/10.1016/j.worlddev.2016.11.013

Afridi, M. A., & Ventelou, B. (2013). Impact of health aid in developing countries: The public vs. the private channels. Economic Modelling, 31, 759–765. https://doi.org/10.1016/j.econmod.2013.01.009

Ali, M., Khan, L., Rawat, A., & Puah, C.-H. (2019). The relationship between aid and

corruption: A case of selected asian countries. Journal of Financial Crime, 26(3), 692–704. https://doi.org/10.1108/JFC-08-2018-0089

Bedeker, A., Nichols, M., Allie, T., Tamuhla, T., van Heusden, P., Olorunsogbon, O., Tiffin, N., & PHA4GE Ethics and Data-Sharing Working Group. (2022). A framework for the promotion of ethical benefit sharing in health research. *BMJ Global Health*, *7*(2), e008096.

Bhopal, A., Knights, D., Knights, F., Bertani, L., Gopfert, A., Guinto, R., Langham, F., Lefebvre, A., Turner-Moss, E., Wanjau, W., Wiley, E., Kumar, P., & Sethia, B. (2018). Essentials of global health: A book for students, by students. The Lancet Global Health, 6(10), e1069. https://doi.org/10.1016/S2214-109X(18)30379-6

Birnie, P. W., Boyle, A. E., & Redgwell, C. (2009). International law and the environment. Oxford University Press.

Botero-Rodríguez, F., Pantoja-Ruiz, C., & Rosselli, D. (2022). Corruption and its relation to prevalence and death due to noncommunicable diseases and risk factors: a global perspective. *Revista Panamericana de Salud Publica [Pan American Journal of Public Health]*, *46*, e10.

Cohen, R. L., Alfonso, Y. N., Adam, T., Kuruvilla, S., Schweitzer, J., & Bishai, D. (2014). Country progress towards the Millennium Development Goals: adjusting for socioeconomic factors reveals greater progress and new challenges. *Globalization and Health*, *10*(1), 67.

Daly, G., Kaufman, J., Lin, S., Gao, L., Reyes, M., Matemu, S., & El-Sadr, W. (2020). Challenges and opportunities in China's health aid to Africa: Findings from qualitative interviews in Tanzania and Malawi. Globalization and Health, 16(1), 71. https://doi.org/10.1186/s12992-020-00577-0

Donaldson, L. J., & Rutter, P. D. (2017). [TITLE[A1]] (4th ed.). CRC Press.

Downs, J. (2021). Maladies of empire: How colonialism, slavery, and war transformed medicine. Harvard University Press.

Feldbaum, H., Lee, K., & Michaud, J. (2010). Global health and foreign policy. Epidemiologic Reviews, 32(1), 82–92. https://doi.org/10.1093/epirev/mxq006.

Ferrie, J. E. (2012). Cholera, John Snow and the 2013 bicentennial meetings at the London School of Hygiene and Tropical Medicine, UK. *International Journal of Epidemiology*, *41*(6), 1501–1502.

Fidler, D. P. (2001). The globalization of public health: the first 100 years of international health diplomacy. *Bulletin of the World Health Organization*, *79*(9), 842–849.

Ghebrewet, S., Stewart, A. G., Baxter, D., Shears, P., Conrad, D., & Kliner, M. (Eds.). (2016). Health protection principles and practice. Oxford University Press.

Grépin, K. A., Fan, V. Y., Shen, G. C., & Chen, L. (2014). China's role as a global health donor in Africa: What can we learn from studying under reported resource flows? Globalization and Health, 10(1), 84. https://doi.org/10.1186/s12992-014-0084-6

Holst, J. (2020). Global health – emergence, hegemonic trends and biomedical reductionism. Globalization and Health, 16(1), 42. https://doi.org/10.1186/s12992-020-00573-4

Hyder, A. A., Puvanachandra, P., & Morrow, R. H. (2012). Measuring the health of populations: explaining composite indicators. *Journal of Public Health Research*, *1*(3), 222–228.

Knapp, V. J. (2000). Diet and disease during Europe's agricultural and industrial revolutions. *Nutrition and Health*, *13*(4), 185–198.

Kuhn, A. K. (1938). The trail smelter arbitration—United States and Canada. The American Journal of International Law, 32(4), 785–788. https://doi.org/10.2307/2190600

Lau, R. R., & Schlesinger, M. (2005). Policy frames, metaphorical reasoning, and support for public policies. Political Psychology, 26(1), 77–114. https://doi.org/10.1111/j.1467-9221.2005.00410.x

Liamputtong, P., & Rice, Z. S. (2022). Participatory Research: Coproduction of Knowledge Research as Inclusive Research. In *Handbook of Social Inclusion: Research and Practices in Health and Social Sciences* (pp. 1–17). Springer.

Lin, S., Gao, L., Reyes, M., Cheng, F., Kaufman, J., & El-Sadr, W. M. (2016). China's health assistance to Africa: Opportunism or altruism? Globalization and Health, 12(1), 83. https://doi.org/10.1186/s12992-016-0217-1

McDade, K. K., & Mao, W. (2020). Making sense of estimates of health aid from China. BMJ Global Health, 5(2), e002261. https://doi.org/10.1136/bmjgh-2019-002261

Merrill, R. M. (2019). Introduction to epidemiaology (8th ed.). Jones & Bartlett Learning.

Ministers of Foreign Affairs of Brazil, France, Indonesia, Norway, Senegal, South Africa, and Thailand. (2007). Oslo ministerial declaration—global health: A pressing foreign policy issue of our time. The Lancet, 369(9570), 1373–1378. https://doi.org/10.1016/S0140-6736(07)60498-X

Misau, Y. A., Al-Sadat, N., & Gerei, A. B. (2010). Brain-drain and health care delivery in developing countries. Journal of Public Health in Africa, 1(1), e6. https://doi.org/10.4081/jphia.2010.e6

OECD. (2018). China's belt and road initiative in the global trade, investment and

finance landscape. https://www.oecd.org/finance/Chinas-Belt-and-Road-Initiative-in-the-global-trade-investment-and-finance-landscape.pdf

OECD. (2021). Health spending. https://data.oecd.org/healthres/health-spending.htm

Rodriguez, P., Uhlenbruck, K., & Eden, L. (2005). Government corruption and the entry strategies of multinationals. The Academy of Management Review, 30(2), 383–396. https://doi.org/10.2307/20159125

Ruths, M. B. (2009). The lesson of John Snow and the broad street pump. Virtual Mentor, 11(6), 470–472. https://doi.org/10.1001/virtualmentor.2009.11.6.mhst1-0906

Sheikh, K., Schneider, H., Agyepong, I. A., Lehmann, U., & Gilson, L. (2016). Boundary-spanning: reflections on the practices and principles of Global Health. *BMJ Global Health*, *1*(1), e000058.

Spicer, N., Agyepong, I., Ottersen, T., Jahn, A., & Ooms, G. (2020). "It's far too complicated": why fragmentation persists in global health. *Globalization and Health*, *16*(1), 60.

Stapleton, G., Schröder-Bäck, P., Laaser, U., Meershoek, A., & Popa, D. (2014). Global health ethics: An introduction to prominent theories and relevant topics. Global Health Action, 7(1), 23569. https://doi.org/10.3402/gha.v7.23569

Stuckler, D., & McKee, M. (2008). Five metaphors about global-health policy. The Lancet, 372(9633), 95–97. https://doi.org/10.1016/S0140-6736(08)61013-2

Syntia Munung, N., Ujewe, S. J., & Afolabi, M. O. (2022). Priorities for global access to life-saving interventions during public health emergencies: Crisis nationalism, solidarity or charity? *Global Public Health*, *17*(9), 1785–1794.

The Economist. (2016). Misplaced charity.

https://www.economist.com/international/2016/06/11/misplaced-charity

Twumasi, P. A. (1981). Colonialism and international health: A study in social change in Ghana. Social Science & Medicine. Part B: Medical Anthropology, 15(2), 147–151. https://doi.org/10.1016/0160-7987(81)90037-5

United Nations. (2014). Millennium development goals: https://www.un.org/sustainabledevelopment/

United Nations. (2015). Sustainable development goals: 17 goals to transform the world. https://www.un.org/sustainabledevelopment/

Wirth, J. D. (1996). The trail smelter dispute: Canadians and Americans confront transboundary pollution, 1927–41. Environmental History, 1(2), 34–51. https://doi.org/10.2307/3985111

World Health Organisation (WHO). (2018). Millennium development goals (MDGs). https://www.who.int/news-room/fact-sheets/detail/millennium-development-goals-(mdgs)