

History as a Partner in Public Health

A Report of the Foresight Think Tank
on the History of Pandemics



Cover Photo: Nurses depart from Blackfriars Depot in New South Wales, Australia, in April 1919. During the Spanish Flu, people confined to their houses displayed SOS signs like the one on the motorcycle's sidecar to signal the need for medical assistance.

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ISBN 978 92 9062 047 1

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Suggested citation. History as a partner in public health: a report of the foresight think tank on the history of pandemics. Manila: World Health Organization Regional Office for the Western Pacific; 2024. Licence: CC BY-NC-SA 3.0 IGO.

Cataloguing-in-Publication (CIP) data. 1. Pandemics - history. 2. Public health – history. I. World Health Organization Regional Office for the Western Pacific. (NLM Classification: WC11.1).

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Acknowledgments

This manuscript is the product of the Foresight Think Tank on the History of Pandemics convened between May and July 2020 by the Data, Strategy and Innovation group of the World Health Organization Regional Office for the Western Pacific.

The members of the think tank include Dr Guido Alfani, Dr Mary Augusta Brazelton, Dr Mary E. Fissell, Dr Monica H. Green, Dr John Manton, Dr Frank Snowden, Dr Adam Tooze and Dr Dora Vargha.

The think tank examined the history of pandemics to explore how past events have shaped the world and might impact the future.

Contributors



DR GUIDO ALFANI

Dr Alfani is a professor of Economic History at Bocconi University in Milan, Italy. He is also an affiliated scholar of the Stone Center on Socio-Economic Inequality in New York and a research fellow at the Centre for Economic Policy Research in London. As an economic and social historian and a historical demographer, he specializes in the history of epidemics and famines in inequality and social mobility in the long run, and in systems of social alliance.

Dr Alfani contributed to chapters 3 (Data and trust), 10 (Inequalities) and 14 (Economy).



DR MARY AUGUSTA BRAZELTON

Dr Brazelton is a lecturer in the Department of History and Philosophy of Science of the University of Cambridge, where she is also an affiliated lecturer in East Asian Studies in the Faculty of Asian and Middle Eastern Studies, as well as a research fellow at the Needham Research Institute, also in Cambridge. Among other topics, her research focuses on the historical intersections of science, technology and medicine in China and around the world.

Dr Brazelton contributed to chapters 2 (Social contracts), 6 (Changed behaviours), 9 (Getting the response right) and 12 (Innovation).



DR MARY E. FISSELL

Dr Fissell is the J. Mario Molina professor in the Department of the History of Medicine at Johns Hopkins University, where she also co-edits the *Bulletin of the History of Medicine*. She has explored how ordinary people in early modern England understood health, healing and the natural world. Her current research examines vernacular knowledge: ideas about the natural world that ordinary people used, made, shaped and practised.

Dr Fissell contributed to chapters 1 (Pandemic narratives), 5 (Rumours and conspiracy) and 9 (Getting the response right).



DR MONICA H. GREEN

Dr Green is an independent scholar previously on the faculties of Duke University and Arizona State University. She specializes in the intellectual and social history of medicine in pre-modern Europe, and in the history of global health. Her current research is on the use of two “medieval” diseases – plague and leprosy – as a framework for developing insights into the origins and dissemination patterns of infectious diseases worldwide.

Dr Green contributed to chapters 4 (Mental health and emotional suffering), 8 (Political and social movements), 10 (Inequalities) and 11 (Community).



DR JOHN MANTON

Dr Manton was an assistant professor at the Centre for History in Public Health, London School of Hygiene & Tropical Medicine, where he headed Humanities and Environmental Sciences at the Antimicrobial Resistance Centre from 2016 to 2020. His research has focused on the history of health planning, development and state, and climate crises in Africa and South-East Asia since 1945.

Dr Manton contributed to chapters 2 (Social contracts), 6 (Changed behaviours), 7 (International versus national interests) and 13 (Environment).



DR FRANK SNOWDEN

Dr Snowden is currently the Andrew Downey Orrick Professor Emeritus of History at Yale University, where he had been a professor of History and the History of Medicine. He has also served as a lecturer and reader in History at London University. He has spoken and written extensively on the social, cultural and intellectual history of medicine and the societal impact of infectious diseases.

Dr Snowden contributed to chapters 4 (Mental health and emotional suffering), 5 (Rumours and conspiracy), 8 (Political and social movements) and 13 (Environment).



DR DORA VARGHA

Dr Vargha is a professor of History and Medical Humanities based both at the University of Exeter, United Kingdom of Great Britain and Northern Ireland, and Humboldt University, Germany. She co-edits the book series *Epidemic Histories* at Johns Hopkins University Press. Her work ranges from the politics of epidemic management to public health systems and access to therapeutics.

Dr Vargha contributed to chapters 1 (Pandemic narratives), 3 (Data and trust) and 7 (International versus national interests).

Executive summary

Epidemics illuminate our social and economic relationships, ethical values and internal divisions.

They also provide an important moment for us to reflect on what they reveal about ourselves and an opportunity to promote transformative change to address the long-term determinants of infection. A public health approach to epidemics that does not take history into account will be limited to short-term emergency responses.

By learning from the past, societies stand a better chance of building health systems that are more effective, responsive, resilient, person-centred, equitable and sustainable in the post COVID-19 pandemic world. Societies can also use what they learn to build stronger economies, heal the environment and make the world more just and equitable.

As a response to the devastation brought by COVID-19, the Data, Strategy and Innovation (DSI) group of the World Health Organization (WHO) Regional Office for the Western Pacific convened four thematic foresight think tanks with experts across the WHO Western Pacific Region and beyond to look at future political, societal, health and economic developments. Their work identified 14 dimensions of a new future and a set of ideas for concrete transformative actions for Member States and WHO. A fifth think tank examined the history of pandemics to explore how past events have shaped the world and could impact the future.

In looking at historical epidemics and evaluating their impact on the world, the fifth think tank applied 14 “dimensions of change” identified by DSI and the four other think tanks. They are: pandemic narratives; social contracts; data and trust; mental health and emotional suffering; rumours and conspiracy; changed behaviours; international versus national interests; political and social movements; getting the response right; inequalities; community; innovation; the environment; and the economy. Key lessons identified by the think tank:

1 Pandemic narratives

Capturing, understanding and shaping the narratives of a pandemic can have far-reaching consequences for the future. Narratives shape how societies make sense of, respond to and learn from pandemics. One of the most valuable resources in understanding a society’s narrative is its art. Metaphors, symbols and visuals transmit collective consciousness and can help make sense of shared experiences.

2 Social contracts

Epidemics reshape social contracts at all levels. Their impacts are intergenerational, and the status and efficacy of contracts are called into doubt. Attention must be paid to the reproduction of social and economic inequalities over time, how disease and its control compound some of these inequalities, and how governments are implicated in maintaining inequality.

3 Data and trust

How governments use data and science has long-term impacts on trust and credibility,

helping shape narratives and social contracts. While science is frequently considered neutral, trust in statistics provided by governments internally underpins the efficiency of public health measures and compliance, and externally makes global epidemic trends understandable. Considering the politics and the credibility of data is crucial in epidemic planning.

4 Mental health and emotional suffering

Public health emergencies and the measures societies take to combat them – such as lockdowns – place enormous psychological stress on people. During crises, authorities often must take actions to prioritize physical health and safety. However, people also need understanding and perspective. Using a historical context, those steps can be explained more fully so that everyone better understands the timelines and goals, leading to higher compliance and less stress among people.

5 Rumours and conspiracy

A disconnect between authorities and the cultural conversation, as well as unclear narratives and lapses in trust, can lead to rumours and conspiracies that shape people's interpretations of what is happening. Rather than dismissing false narratives, they should be replaced by accurate and persuasive information that engages the community and bolsters trust in legitimate sources.

6 Changed behaviours

Epidemics and pandemics establish new norms, and these transformations can be deeply influenced by race, class, gender and politics. Disease prevention is not always the result of cutting-edge science. Many other factors or motivations can prompt changes to behaviour that discourage the spread of disease.

7 International versus national interests

Epidemics do not always lead to collective action at the international level, as other national interests may take precedence over public health. However, formal and informal international networks can play a crucial role in coordinating epidemic management. Many international organizations have helped raise awareness. During and after an epidemic, scientists may be able to open spaces for collaboration that would have been impossible in a different geopolitical climate.

8 Political and social movements

Epidemics have played variable roles in triggering political and social movements. The political outcome of a pandemic is not predetermined by the pathogen, but rather by human moral choices. They can change the way we use, exploit and protect the environment, including cities and the built environment.

9 Getting the response right

Political legitimacy and epidemic containment and control are interlinked both in the national and international spheres. Political stability in past epidemics has been linked to authorities being seen as getting the response right.

10 Inequalities

Epidemics shine a light on inequalities and systemic discrimination. Disease dynamics, access to care, control measures and economic effects have a compounding and long-term impact on social equality. Pandemics can present an opening to improve the lives of the poorest and most fragile groups.

11 Community

The COVID-19 pandemic put a new burden on definitions of “community”. This was the first time the world had simultaneously been in a pandemic event and watched its impact globally in real time. Popular ideas about immunity, such as exposure to relatively mild pathogens strengthening the immune system, existed before COVID-19. Sometimes popular ideas or misconceptions shape responses to emerging epidemics.

12 Innovation

Pandemics can lead to systems-level innovations. However, selective or uneven implementation of these innovations can expose or exacerbate existing structural and societal inequalities, as well as affect the environment. Recognizing how the needs of certain groups have historically been undervalued or ignored may better inform preparedness planning in the future.

13 Environment

Epidemics reshape the relationships of societies with the environment. They can change the way people use, exploit and protect the environment, including cities and the built environment.

14 Economy

Economic recovery after major pandemics has historically been uneven, compounding inequities at the national and subnational levels. Women may suffer significantly greater economic damage compared to men.

Visitors tour an exhibit in 2020 on disease outbreaks at the Smithsonian National Museum of Natural History in Washington, D.C.

Where in the World Are Outbreaks Occurring?

*“What’s next is already here;
we just haven’t recognized it yet.”*

— Daniel Lucey, Public Health Physician, 2016

FOR YOUR SAFETY
TOUCH-ACTIVATED
INTERACTIVE
EXHIBITS HAVE
BEEN TURNED OFF

HAVE FUN!
AND PLEASE WASH
YOUR HANDS!

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A health worker filling out a form during the COVID-19 response in Kiribati in 2022.

Introduction

Awareness of history is crucial to planning for the future, and a lack of awareness can lead to lapses in epidemic preparedness and management. Epidemic diseases are revealing moments because they reflect the nature of the society they affect.

Human organizations or societies contribute to creating the conditions that pathogens exploit to spread. For that reason, they illuminate societies' social and economic relationships, ethical values and internal divisions. They also provide an important moment for populations to reflect on what they reveal about themselves, and an opportunity to promote transformative change to address the long-term determinants of infection.

For this reason, history as a discipline complements science, public health and epidemiology, which have traditionally led the societal reaction to infectious diseases. Using a historical lens during a public health crisis can add value to the response. By comparatively analysing multiple past epidemics, history seeks to uncover their long-term determinants – economic, environmental, cultural and societal. The unfolding of the COVID-19 pandemic in 2020 made it critical to understand how this event would affect health systems in the World Health Organization (WHO) Western Pacific Region more broadly. WHO used the methodologies developed to explore longer-term health futures to investigate how the pandemic is changing the world and shaping a new future.

The Data, Strategy and Innovation (DSI) group of the WHO Regional Office for the Western

Pacific convened foresight think tanks with experts across the Region and beyond to look at future political, societal, health and economic developments. Their work identified the main dimensions of a new future and a set of ideas for concrete transformative actions for WHO and Member States.

This report is designed to capture the work of the Foresight Think Tank on the History of Pandemics. The think tank analysed history using 14 “dimensions of change”, which were identified by the other four think tanks as relevant to the current global context. They are: pandemic narratives; social contracts; data and trust; mental health and emotional suffering; rumours and conspiracy; changed behaviours; international versus national interests; political and social movements; getting the response right; inequalities; community; innovation; the environment; and the economy.

The historians applied these 14 dimensions in looking at histories of epidemics and evaluating the impact they had on the world. They considered the events' influence on a range of issues affecting human life – such as mortality, mental health, the economy, technology, geopolitics, social movements, health-care delivery and policy decision-making, among others – to help health decision-makers gain insights into how to best respond to global pandemics, based on the contexts and trajectories of epidemics throughout human history.

14 KEY THEMES

Exploring how past events have shaped the world and might impact the future

THEME ONE

Pandemic narratives

Narratives of a pandemic shape the way societies make sense of, respond to and learn from epidemics.

Narratives construct the meanings of epidemics as they unfold and reconstruct them for the public and public health planners as they look back.

Narratives are intricate stories with a cultural reasoning among a given society. These stories may go beyond the facts. Societies understand and make sense of epidemics through narratives. These narratives can range from the scientific, as told through incidence rates and epidemic curves, to political and personal stories. People develop at least three kinds of narratives about an epidemic:

- Why is it happening?
- Whose fault is it?
- What effects does it have?

Each of these narratives has profound consequences for the ways in which countries, public health officials and the public deal with a crisis of epidemic disease. Narratives are not just about truth versus falsity: they are also tools with which data and frameworks are selected to understand disease and health. Epidemic narratives become increasingly important in the case of new diseases, which are surrounded by scientific uncertainties.



Medical workers look after an intubated patient with COVID-19 in French Polynesia in 2021 during the pandemic.

People have often sought narrative explanations for disease outbreaks: Why is this terrible thing happening here and now?

Long before germ theory, people argued that outbreaks of the plague were due to “bad air” or a conjunction of the planets. During the 15th and 16th centuries in Europe, the bad air explanation prompted those with enough wealth to flee cities threatened by plague outbreaks, sometimes inadvertently transmitting the disease themselves. Other outbreaks were seen as punishment from the gods for social sins.

Often, these explanations hinge upon diseases being brought from other places. Paul Farmer calls this a “geography of blame” – stories that explain how the source of an epidemic comes from another country or ethnic group so that outsiders can be blamed (Farmer, 1992). Since the start of the COVID-19 pandemic, there have been increasing instances of unprovoked attacks on individuals perceived to be Chinese due to a belief that they are to blame for the pandemic (Tavernise and Opiel, 2020).

Stories about China as a source of epidemic diseases are not new, but their meanings have shifted. In the late 19th and early 20th centuries, these stories depicted China as a backward society that harboured old diseases, such as plague. When the plague arrived in Honolulu in 1899, a mob burned down the city’s Chinatown. When it then jumped to San Francisco, the outbreak prompted violence against the Chinese American population

and public health measures that seemed to imply that the Chinese were at fault (Shah, 2001; Mohr, 2005).

History is rich in narratives that show epidemics triggering violence and hate, such as the Black Death, typhus in Eastern Europe in the late 19th and 20th centuries, plague in the 16th and 17th centuries, cholera in various places in the 1830s (in Italy in 1911) and smallpox as well as HIV/AIDS in modern times. However, the epidemics of unknown causes in antiquity – such as the influenza pandemic of 1918–1919 and yellow fever across sites and regions in the Americas and Europe – have also shown how crises can unify communities, healing wounds from previous social, political, religious, racial and ethnic tensions and anxieties (Cohn, 2012).

Origin stories can also take the form of “patient zero” narratives. In these cases, the behaviours of a single person are vilified. Sometimes an individual is blamed for an entire outbreak. Richard McKay calls this a “genealogy of blame”. The term comes from Randy Shilts’s narrative about AIDS, in which a single flight attendant was targeted as “the source” of the outbreak in the United States of America because of his sexual behaviour. The stigmatizing label “patient zero” was used in the COVID-19 pandemic to play upon existing tensions, with the British tabloid *Mail on Sunday* implying that Michel Barnier, the chief European Union negotiator, somehow served as a “patient zero” for then-Prime Minister Boris Johnson of the United Kingdom of Great Britain and Northern Ireland (McKay, 2020).

The same epidemic can be narrated in very different ways, with different implications for policy and practice. For example, the Black Death (an early phase of the Second Plague



“Plague in an Ancient City” was painted by Flemish artist Michael Sweerts during his sojourn to Rome, where he witnessed the outbreak of the bubonic plague from 1648 to 1650. One of the finest depictions of ancient plagues, the painting is owned by the Los Angeles County Museum of Art.

Pandemic experienced in western Eurasia and Africa) was not called as such until the 18th century. It was also not widely discussed in medical historiography until the 19th century, when scholarly interest was sparked in part by cholera epidemics new to Europe. The Black Death has been narrated as a cataclysmic event that paradoxically ushered in significant developments, including the Renaissance, the printing press, European overseas expansion and early modernity itself. Alternately, other historians have seen the epidemic as the worst of a long series of medieval crises (such as famines) from which societies recovered relatively quickly (Getz, 1991; Belich, 2016).

Until vaccines became widely available, poliovirus outbreaks were seen as civilizational markers, caused by lack of exposure to the virus at an early age because of improved sanitation. As vaccination took hold, polio quickly became a sign of backwardness and was connected to unhygienic practices and poverty.

Epidemic narratives seek closure, but epidemics do not end neatly. Epidemics are mostly described through epidemiological models that have entered public conversations, prioritizing a biological process that adheres to “natural” laws. When discussed as social phenomena, governments and political commentators often use war metaphors.

They often liken the crisis to a fight against an invisible “enemy” that will not only bring casualties and demand sacrifice from society, promising an eventual closure akin to D-Day or a peace treaty. However, similar to wars, the endings of epidemics are never straightforward and rarely have singular endpoints. The endings also do not undergo the same scrutiny as the beginnings. Instead, even within the same society, endings can happen in variable ways, on different timelines, in different places and for different people and communities. Epidemic endings are as much the result of political and social decision-making, as a decline in the incidence rate and reproduction number.

Technological solutions in prevention or treatment (for example, vaccines or pharmaceuticals) may provide remedies. At the same time, however, they raise multiple issues, such as access, cost, uptake and efficacy. In other cases, epidemics present in multiple waves (for example, 1918–1919 influenza, polio epidemics, plague pandemics) or end with a transition to endemicity (for example, plague in Madagascar). Some epidemics end with a loss of urgency in health policy, even as a growing number of people continue to be afflicted (for example, tuberculosis, HIV/AIDS, legionella) (Greene and Vargha, 2020).

THEME TWO

Social contracts

Epidemics reshape social contracts at all levels; their impacts are intergenerational and can cast doubt on the status and efficacy of contracts.

A social contract refers to an implicit agreement among the members of a society to cooperate for social benefits, for example by sacrificing some individual freedom for state protection (Oxford English Dictionary, 2009). The idea of a social contract has been central to theories of liberal governance since the 17th century, illuminating problems of resource stewardship and allocation in a wide range of social and political situations. The shift away from an absolute monarchy in the United Kingdom of Great Britain and Northern Ireland and in France between 1640 and 1800 revitalized legal and moral constraints on the exercise of power at a time when property was being consolidated in the hands of a small portion of the population. Imperial control of overseas territories greatly expanded through the 19th century and cemented a historical relationship between the social contract and the intergenerational compounding of privilege and disadvantage. This resulted, among other things, in the catastrophic maldistribution of resources for preparing for and managing epidemic and endemic disease.



A police officer conducts identification checks during a July 2021 lockdown to curb the spread of COVID-19 in Sydney, Australia.

Historical inattention to endemic diseases of poverty – consider the aptly titled “neglected tropical diseases” and the underinvestment in infectious disease control in the 20th century colonial world – offers ample evidence of the consequences of systemic inattention to the distribution of infectious disease morbidity and mortality.

Today, the term social contract is often used to describe relations between institutions and communities in terms of obligations and responsibilities. It is commonly admitted that the social contract is enforced through accountability and legislation. It is important to point out that accountability is more difficult to enforce for historically under-resourced communities. At the same time, one of the functions of the state – even of the colonial state – is to determine and declare an epidemic (Lyons, 1992) and to organize often draconian means of control.

This function was discharged in the case of human African trypanosomiasis (also known as sleeping sickness) not only by the military medical mobilization of the Belgian colonial state in the Democratic Republic of the Congo in the 1920s and 1930s, but also by British colonial rulers restrictively addressing the plague in port cities in India and South Africa around the turn of the 20th century, and throughout the first half of the 20th century using health cordons and restrictions on the movement, commerce and labour of Africans in French West Africa (Echenberg, 2002).

To persuade, encourage and coerce individuals and communities to submit to onerous disease transmission controls, governments and policy-makers produce and invoke ideas of the greater good. In the colonial cases mentioned above, the more onerous outcomes of disease control measures fell on colonized populations.

Assumptions of the universal applicability of the social contract can obscure or complicate efforts to learn from past pandemics.

Still, current conceptions of public health reinforce the explanatory appeal of the social contract. National guardianship in public health underpins the legitimacy of the contemporary nation-state and the international system in critically important ways. Varieties of social contracts overlap within and between territories, and shift over time according to institutional and community pressures. This may have a negative impact on states’ ability to enforce preparedness duties.

It has also always been the case that specific groups (occupational, property-owning and stratified by ethnicity and gender) have greater access than others to supposedly common resources, and both advantages and disadvantages are compounded across generations. The exercising of economic power and property rights in reshaping colonial cities during the Third Plague Pandemic (since the mid-19th century) shows how even well-intentioned disease control policy can compound the privilege of the already wealthy (Bigon, 2016). Rather than contesting this process, the apparatus of the social contract makes it easier for the well-endowed to maintain and stabilize advantage in otherwise fraught political situations.

A social contract can be used to secure or

How useful, then, is the idea of a social contract for enforcing public health measures in epidemic situations?

protect preferential access to institutional goods. It can also be used to hold states to account when it comes to protection of the health, lives and livelihoods of their citizens. While social contracts may have critical potential for enhancing equity, there are always broader geopolitical concerns in play.

Concepts of social contract are not always able to capture the fact that people are differentially affected by pandemics and their control. Some people are more vulnerable than others. When thinking in terms of the social contract and its revision, attention must be paid to the reproduction of social and economic inequalities over time, how disease and its control compound some of these inequalities and how political power can be intimately implicated in maintaining inequality.

THEME THREE

Data and trust



A staff member from Malaysia's Ministry of Health records data on COVID-19 cases at the National Public Health Laboratory in Sungai Buloh in March 2021.

How governments use data and science has long-term impacts on trust and credibility, and helps shape narratives and social contracts.

Trust, statistics and health policies: Statistics rest on universal claims of objectivity. Numbers can be easily translated across borders and do not require intimate knowledge of the locale; thus, they are technologies of distance (Porter, 1995). Health policies have been informed through a convergence of medical research and statistics from the 18th century onwards, trust established in these statistics by national and transnational institutions, standardization of data, and rendering of Member States “readable” through statistics as a basis for decision-making in international organizations. Yet, trust in epidemic numbers is underpinned by a multitude of assumptions about the efficiency of the public health system, diagnostic and reporting practices, political hierarchies and accountability, and the internal and external credibility of national governments and/or political systems.

While the complexity of the production of metrics and statistics is difficult to track in real time, historical analysis sheds light on practices that shape local, national and global policies and epidemic response.



Serbian soldiers receiving treatment during the 1918–1919 influenza pandemic, which broke out near the end of the First World War. The name “Spanish Flu” resulted from the fact that Spanish newspapers freely reported on the pandemic, while newspapers in countries involved in the war often suppressed bad news to maintain morale. This created a false impression that Spain was the centre of the pandemic and the subsequent misnomer.

Mistrust and the politics of epidemic statistics: Mistrust in the potential uses of vital and health statistics affect the ways data are collected, shared and made visible. A broader concern over war efforts, and the potential to reveal vulnerability, led to censored national reporting of influenza cases during the 1918–1919 pandemic in most European countries. The epidemic earned the name “Spanish flu” since only the neutral Spanish papers reported openly on the outbreaks.

Credibility of public health intervention results: While science is frequently considered as neutral, trust in statistics provided by governments internally underpins efficiency of public health measures and compliance,

and externally provides readability of global epidemic trends, considering the politics and the creation of credibility is crucial in epidemic planning. Intentional reporting of epidemic statistics is done by national governments. For example, the Italian Government in 1911 successfully concealed an epidemic of cholera with the complicity of the United States of America. Since Italy was a major source of emigration and a major tourist destination, there was a serious danger of causing a transnational spread of the disease (Snowden, 1995). In the 1950s, WHO stepped up as the validator of vaccines – testing results and providing recommendations on polio vaccines – when trust in trial results broke down across geopolitical lines.



A government official examines COVID-19 data in the Republic of Korea in February 2022.

Uses of past data: historical statistics as evidence in current policy-making. Comparisons in morbidity, case fatality rates and mortality rates, and epidemic statistics are central not only across countries and regions or concurrent diseases, but also across time.

Past incidence rates and statistics (or lack thereof) are often cited in arguments for or against interventions in anticipating consequences of outbreaks on society, politics and the economy. For this reason, it is imperative that past demographic patterns be scrutinized and that epidemiological modelling be based on sound historical data. Indeed, the problems that people face today in making sense of apparently contradictory data are analogous to those faced in past pandemics.

The somewhat naive nature of recent debates about Spanish flu mortality is evidence of the risks resulting from imperfect communication between different branches of science and social science. For past pandemics, significant advancements can be made only by validating/calibrating macro-level information with in-depth case studies. For example, in the case of plague, recent micro-level studies (applying survival analysis techniques to carefully reconstructed individual-level historical data) led to doubts about general conclusions obtained by using rough methods that rely upon excess mortality by age and biological sex (Alfani and Bonetti, 2019).

THEME FOUR

Mental health and emotional suffering

The mental health effects of COVID-19 may be more long lasting and no less economically disruptive than the virus itself.

The COVID-19 pandemic has been associated with a rise in mental and neurological illnesses (Pappa et al., 2022). This phenomenon trailed the pandemic by weeks or months, but it has been no less consequential in its impact than the physical disease. In the wake of the virus, there have been spikes in depression, anxiety, substance abuse, domestic violence, insomnia, suicide and post-traumatic stress disorder (PTSD). As the effects of the pandemic continue to manifest, it is likely that mental health struggles will be exacerbated, compounded by job loss and income insecurity. Unfortunately, societies find themselves even less prepared to mitigate and contain the mental sequelae of COVID-19 than the physical disease (Moreno et al., 2020).

History and the mental health sequelae of epidemic diseases. As one of the most culturally inflected aspects of health – bound up, as it is, in the words and behaviours humans use to reflect interior states – mental health is inherently difficult to assess across time and cultural boundaries.



A painting by William Sharp and Benjamin West from 1793 depicts a suffering King Lear.

Nevertheless, it is clear that epidemic and pandemic events negatively impact the psyches of individuals and the fabric of social structures. Society has prioritized physical health while devoting scant resources to health care for mental illnesses. For historians, the situation is greatly complicated by the fact that psychiatry as a field did not develop until the late 19th century. As such, medical records dealing with mental illness are scarce before that time. Even before the age of psychiatry, however, there are sources that can yield insight into the mental world of societies.

Art and literature, for example, provide clues that merit further exploration with regard to bubonic plague. An illustration is that of William Shakespeare, whose life was marked and disrupted by a series of major plague epidemics. Attention has been drawn to the frequency with which plague appears in the text of his plays for the fear the word itself elicits, and to the possibility that later works such as *King Lear* and *Macbeth* portray the devastated mental landscape of a world in the aftermath of pestilence. In *King Lear* (Shakespeare, 1994), we learn:

Love cools, friendship falls
off, brothers divide; in cities,
mutinies, in countries, discord,
in palaces, treason; and the bond
crack'd 'twixt father and son.

Shakespeare, William. *King Lear*. Act 1, Scene 2.

More directly, Daniel Defoe's novel *Journal of the Plague Year* – an imaginative reconstruction produced 55 years after the 1665 plague it depicts – describes the pervasive fear and anxiety of plague-struck London.

Even plague suicides are reported. No less evocative are the visual arts with works such as Pieter Breugel the Elder's *The Triumph of Death* and Nicholas Poussin's *The Plague of Ashdod*. Retrospective diagnosis on the basis of such works cannot be conducted, but it can be established that contemporaries regarded plague as more than just a physical illness.

For certain epidemic diseases, however, the mental impact has long been known because of the injury done to the brain itself. A clear example is syphilis, which is known in its final stage to cause severe neurological damage, leading to dementia, loss of motor control and paralysis.

As “insane asylums” were built from the 18th century onward, sufferers of tertiary syphilis became one of the largest cohorts in the patient population. Another example is malaria, which was known in the 19th century as the “disease of laziness” because its impact on mental functioning severely reduced productivity and could lead to cachexia, or total indifference to one's surroundings (Pearce, 2012). The longest history of medical interest in the mental sequelae of epidemic disease is that of pulmonary viral diseases. Since the 18th century, pandemics of influenza have been thought to produce severe mental disease.

Originally, these psychic disorders were even termed “influenzal psychoses”, and the symptoms were described as depression, anxiety, restlessness and dementia with hallucinations. In the aftermath of the pandemic of 1918–1919, the mental sequelae of the flu were rebaptized as “dementia praecox”. Psychiatrists in the 1920s speculated that exposure of a pregnant woman to the flu was correlated with a vulnerability to dementia praecox in the adult life of her child,



A student listens to the headmaster during a counselling session at a school in Suva, Fiji, in September 2022.

and that exposure of a child to the flu was associated with greatly enhanced vulnerability to the same disease, although the terminology was changed to schizophrenia. The asserted relationship between flu pandemics and psychosis remains a suggestive but unproven hypothesis.

A stronger link has been suggested more recently between severe acute respiratory syndrome (SARS) and mental sequelae although not psychoses. In Hong Kong SAR (China) for example, a decade after the outbreak of the disease in 2003 at the Amoy Gardens apartment complex and the Prince of Wales Hospital, a proportion of the physicians and nurses who treated SARS patients, as well as of the patients themselves, were still receiving psychological care for symptoms resulting from PTSD, including depression, panic attacks and insomnia (Tsang, 2013).

The SARS example suggests that epidemics and their societal effects are analogous to PTSD that has been documented for other well-studied examples of disasters. These include famines, earthquakes, the Great Depression, the terrorist attack on the World Trade Center in New York City and the Great Recession. All of these events resulted in conditions widely considered to lead to mental disorders (Norris et al., 2009) in many of those affected, such as isolation, a sense of helplessness, uncertainty about the future, fear for the possible impact on family members, the severe disruption of normal daily life and its replacement by chaos.

Even in the early stages of the COVID-19 pandemic, media reports and studies indicated in many contexts that its occurrence, accompanied by economic impacts and lockdowns, coincided with spikes in domestic violence, substance abuse, suicides, and widespread reports of depression and anxiety. These effects have been most carefully studied among front-line health-care workers who have coped with stress-inducing conditions such as: fear for their health and their families; inadequate personal protective equipment; chaotic conditions in overwhelmed hospitals; a sense of helplessness arising from the lack of an effective remedy or clear treatment protocols; the absence of a robust mental health system to deal with their condition; and the sheer burden of their workload.

A study by Chinese researchers of 1257 doctors who experienced the peak of the epidemic in early 2020 in Wuhan indicated that more than half reported depression, 45% anxiety and 34% insomnia. Other front-line personnel such as bus drivers, grocery store workers and delivery workers also reported experiencing increased mental health symptoms (Lai et al., 2020).

THEME FIVE

Rumours and conspiracy



Passers-by on the streets of Japan with masks checking their smartphones in April 2022 amid the COVID-19 pandemic.

A disconnect between authorities and the public discourse, as well as an unclear narrative and a loss of trust, can lead to rumours and conspiracy theories that shape the way societies make sense of what is happening.

In epidemics, information can be scarce and yet is at a premium, so rumours and gossip are recruited to fill that gap. In the case of the COVID-19 pandemic, the world faced a new disease for which even basic scientific knowledge was still being gathered. Rumours were used to make sense of pervasive uncertainty. Rumours can also develop into conspiracy theories, building upon extant social tensions. Pogroms against Jews in some places during the Black Death, for example, were a reaction to conspiracies about their perceived role in the plague pandemic.

Public health work is therefore also cultural work. It has to capture something about prevailing public discourse to be able to coexist with rumours, be more persuasive than rumours and ultimately supplant rumours with better knowledge. WHO has repeatedly stressed that an epidemic of misinformation accompanied the COVID-19 pandemic and posed a severe challenge to successful dissemination of public health practices.

Rumours also provide answers for the anxious public when scientific knowledge is incomplete or disputed.

Samuel Pepys, the 17th-century diarist, recorded many rumours as he lived through the 1665–1666 plague epidemic in London. He noted that wigs were thought to convey the dreaded disease, as they were often made from the hair of the deceased (Pepys, 1633–1703). Elaborate powdered wigs were routinely worn by elite men and women, but now they might harbour danger. At the onset of the COVID-19 pandemic, people too experienced such gaps in knowledge, often addressed in conversation and gossip. Which medicine should I take? Should I keep physical distance of two metres or one?

Hospitals for infectious diseases have long been hotbeds for gossip and storytelling. Pepys, for example, narrated an elaborate tale about a maidservant dragged off to a plague hospital against her will while an aristocrat observing the scene from her coach recoiled in horror. During the Third Plague Pandemic, rumours of British plots to reduce the Indian population and to demand sexual favours from Indian women surrounded the plague hospital on Arthur Road in Bombay (now Mumbai), leading to violent clashes and riots (Snowden, 2019).

In north-east China, an epidemic of pneumonic plague in 1910–1911 gave rise to rumours that combined nativist and anti-medical themes. Familiar stories with local inflections spread about people going into hospitals and not coming out, patients being poisoned in those hospitals, and Russian physicians on-

site for plague prevention work killing local Chinese and making medicine out of their organs for their own use (Gamsa, 2006). Some of these rumours persisted decades later. Combined with traumatic experiences of harsh plague-control measures, such as open-air post-mortem exams and mass cremations, they resulted in lasting fears and mistrust of foreign physicians. This became associated in particular with Japanese physicians who arrived in the region as part of the Japanese occupation in the 1930s (Rogaski, 2010).

Rumour and conspiracy have popular explanatory and political power where medical rationale and research objectives are opaque. According to discussions on the histories of HIV and simian immunodeficiency virus in Cameroon, the biological conditions for the viruses to spread grafted onto a century of minimal medical care and intervention (Leoz et al., 2015).

Rumours might inform scientific or public health decision-making. Rumours and conspiracy theories are not exclusive to the past or to societies often represented as “ignorant”. Soviet virologists were suspicious of the Sabin vaccine developed in Soviet–American cooperation, believing it to be an American plot to undermine the health and fertility of Soviet youth. Similarly, scientists from the United States of America dismissed the Soviet Sabin trials and accused their Soviet counterparts of falsifying data in order to undermine health in the United States of America (Vargha, 2015).

In a more recent tragic variation on this theme, the polio vaccination campaign was brought to a halt in Kano State in Nigeria in 2003–2004, as rancorous power politics amplified rumours that the oral poliovirus vaccine contained an anti-fertility agent aimed at population control in predominantly Muslim northern Nigeria.

People's reluctance to be vaccinated due to this belief resulted in a resurgence of wild poliovirus infection in the southern Sahel (Ghinal et al., 2013).

Rumours can be central to social unrest. In the 1832 cholera outbreak in the United Kingdom, temporary hospitals were set up in big cities, and rumours spread that doctors – seemingly powerless against the new disease – were harvesting the bodies of victims for dissection. In the wake of the highly publicized Burke and Hare scandal a few years earlier, in which the bodies of poor people were exhumed to provide anatomical specimens, such stories had their own cultural logic. Riots ensued against hospitals in Liverpool, Manchester, Bristol, Leeds and Glasgow, while those in Sunderland, Aberdeen and the East End of London used the language of “burking”, a term coined after Burke and Hare referring to the practice of murdering a person for the purpose of selling the corpse.

In later cholera epidemics, **rumours quickly grew into full-blown conspiracy theories.** In the Russian Empire and Italy, the return of the disease was explained as the rich poisoning the poor en masse. In 1892 in Tashkent, immigrant Sarts rioted because they believed the disease had been designed to wipe them out. It took three days to restore order in the Donetsk riots in Ukraine. As cholera spread, so too did riots based upon the idea that the epidemic was deliberate and aimed to kill off the poor; Hamburg, Munich and Livorno all saw such riots. In the 1884 and 1911 Italian cholera outbreaks, Naples, Sicily, Puglia and the Abruzzo regions experienced similar kinds of rioting.

These episodes occurred decades after John Snow had elucidated the waterborne spread of the disease and Robert Koch had cultured the bacillus responsible. In these instances, scientific knowledge had little power against popular beliefs and long-held grievances (Cohn, 2017).

Rumours, shading into conspiracy theories, can be used to explain failures.

In 1950s Hungary, after the Government vaccinated the population against polio with inactivated vaccine, a large outbreak resulted. While the reasons behind the new outbreak are unclear (issues with vaccination method, equipment, compliance, reporting), a persistent rumour was that the Government wanted to cut expenses and gave only a half-dose because it prioritized investment in heavy industry over the lives of citizens (Vargha, 2018a).

Such narratives can sometimes only be gained from oral history interviews as ordinary people's beliefs and storytelling may not be recorded well. They can play a near-invisible role in undercutting public health campaigns unless public health workers pay attention to rumours and the cultural logic that underlies them.

THEME SIX

Changed behaviours

Epidemics and pandemics establish new norms, and these transformations can be deeply influenced by race, class, gender and political factors.

Epidemics and protracted emergencies change how people live and behave, and these impacts can be long-term. The experience of past epidemics has shaped where people live, what they eat and how they interact. Such changes in individual behaviours can have large-scale consequences. For example, in the 17th and 18th centuries, the Manchu rulers of China's Qing Dynasty feared smallpox so much that they established *bidousuo*, shelters where healthy members of the Imperial family would retreat to avoid contact with ill people during smallpox outbreaks. Unlike their Han Chinese subjects, variolation was not commonly practised by those of Manchu ethnicity before the Qing conquest (Chang, 2002).

Fear of epidemics also reconfigured patterns of European settlements in tropical colonies. In 19th-century India, developing concepts of tropical diseases provoked agents of the British Empire to move to “hill stations” in the hot summer months in order to avoid outbreaks of cholera and other infectious diseases (as well as political unrest) in major cities. Other adaptations can result from a need to reallocate labour and explore alternative food sources in spite of prior cultural resistance.



A health worker in Papua New Guinea in March 2022 presents a poster outlining COVID-19 safety and awareness procedures.



Health workers in Hong Kong SAR (China) in March 2020 appeal to people to stay home and maintain social distancing to combat COVID-19.

Such changes in behaviour can result in significant stigmatization and have major political consequences. Invoking the risk of epidemics can provide a useful motive for a variety of other actions serving any number of social and political aims. For example, in the late 17th century, the Panchen Lama of Tibet – an ostensible ally of China’s Qing Dynasty as well as a supporter of the Zunghar Mongols in their campaigns against the Qing – avoided having to attend an audience with the Qing Emperor by claiming exposure to smallpox (Chang, 2002).

Exposure to a disease or involvement in its treatment can stigmatize individuals, groups or even nations. Volunteers involved in the 2013–2016 Ebola response, such as the so-called “cremation boys” in West Africa, have faced social exclusion because they were seen to be tainted by the disease and their roles disposing or caring for bodies (Kingori, 2016). The problem of stigmatization is perhaps most prominent in the case of HIV, as it hindered research, prevention and treatment across the world.

Public health responses to epidemics have also resulted in long-term changes in behaviour. Interventions by the state, nongovernmental organizations, elites and other groups can contribute to these transformations. In colonial settings, many such interventions have represented the imposition of discourses of “hygienic modernity” (Rogaski, 2004).

Efforts to transform behaviour as a means of promoting public health often give expression to underlying political and social ideologies, with political ramifications. The Rockefeller Foundation’s hookworm control programme in the Philippines reengineered local toilet and personal hygiene practices and individuated responsibility for disease control. However, these interventions emanated from germ theories that viewed the local population as responsible for contaminating American colonists, giving support to the idea that the United States had to maintain its colonial rule (Ettling, 1981; Anderson, 2006). Efforts also exist to reconcile long-standing practices with the encouragement of new behaviours

and technologies in the name of epidemic prevention. In China in the 1930s, physicians introduced the dumbwaiter turntable in order to prevent tuberculosis infections deriving from the Chinese practice of communal eating and drinking (Lei, 2010). Again, these transformations can be shaped by gender, race, class and other factors.

What works to prevent disease is not always the result of cutting-edge science. A range of motivations can result in widespread changes to behaviour that discourage the spread of disease without necessarily relying on scientific innovation. The “Gospel of Germs” was a wide-ranging social movement, following the 19th-century rise of bacteriology, that promoted hygienic transformations in the domestic sphere in the United States, such as the use of individual drinking cups. These discourses built upon older disciplines of sanitary science that attributed disease to filth and airborne infection (Tomes, 1998).

Efforts to live in a way that prevents some infectious diseases can sometimes be conducive to spreading others. Pathogens exploit the channels that social forms create for them and co-evolve with their hosts. Changes in behaviour might prevent the transmission of one virus or bacterium, but then open new and alternative pathways for other infections. For example, as a result of the development of hygienic infrastructures in the early 20th century, middle- and upper-class children in the United States of America and Europe were no longer exposed to cholera, plague and other diseases. However, they were also no longer exposed to polioviruses in infancy when maternal antibodies typically offered sufficient protection for those exposed to develop immunity. Instead, they encountered polio infection later in childhood without the



A nurse administers a COVID-19 vaccine at a vaccination centre in Honiara, Solomon Islands, in June 2022.

benefit of such protection, resulting in a higher incidence of the paralytic form of the disease (Rogers, 1992).

The establishment of discourses and practices of preparedness is a long-term consequence of epidemics. Planning to prevent or control future outbreaks can originate at different levels of social organization. For instance, in 15th-century Venice, *lazzaretti* (plague hospitals) were first legislated at the municipal level, and the first permanent health boards appeared in Italian city-states from about the same period. In early 20th-century China, responsibilities for epidemic prevention via epidemiological intelligence and vaccine production were given to national institutions that developed extensive regional networks. One such institution, the National Epidemic Prevention Bureau, was founded in 1919 in the wake of a number of infectious disease outbreaks in northern China. On an individual level, altering behaviours to conform with hygienic norms and adhering to vaccination regimens might be considered a means of personally preparing for epidemics, as well as contributing to community and public health.

International versus national interests



A health worker in Viet Nam receives COVID-19 vaccine doses from the COVAX Facility in May 2021.

Epidemics do not always lead to collective action at the international level as national interests take precedence over public health. However, formal and informal international networks can play a crucial role in coordinating epidemic management.

Epidemics and pandemics are at once local, national and international affairs, and require equal consideration in planning at all levels. People's experiences of epidemics, responses to them and their consequences are at once highly individual and collective. Local, national and international frameworks and practices are therefore inseparable, and these three registers need to be taken into account in planning for the future. The role of local authorities in managing epidemic outbreaks and the long-term consequences of social structures, economic impact and overall public health have been demonstrated throughout the centuries. City health boards, which respond to local political landscapes and social and economic structures and needs, have had demonstrable, significant effects on epidemic outcomes.

Examples include the 1630 plague outbreak in Florence (Henderson, 2019) and the 1866 cholera epidemic in New York City (Rosenberg, 1987). Local experience and response are embedded in national government responses, which in turn take into account geopolitical concerns, political frameworks and overall population policies. Interventions in the Third Plague Pandemic in Asia in the late 19th century, as well as sleeping sickness research and control in Africa in the 1920s, for example, were governed by the interests of European powers and their imperial structures. Nationally governed responses are thus situated in international structures, global or regional/political formations, as well as in international political, scientific and diplomatic networks. For instance, the development and implementation of oral polio vaccines in the 1950s and 1960s resulted from an interaction of local needs and capabilities, which determined the efficacy of existing prophylaxis; national health systems and political priorities, affecting investment in alternative solutions; international scientific networks that enabled accelerated research and testing; and political allegiances that permitted the quick transfer of vaccines and models across continents.

Epidemic crises bring to light underlying tensions between national sovereignty and internationalism, and between science, diplomacy and trade. Actors governing and practising international health often have multiple allegiances and accountabilities to scientific communities, national governments and international organizations, while working under political and economic pressures, among others. Current international and global health structures are rooted in mid-19th century efforts to harmonize quarantine practices and the

issuing of clean bills of health on the city/port level with national, imperial and transnational goals, in order to ensure functioning sea trade routes while curbing plague, yellow fever and cholera epidemics.

The ability to reach agreements and achieve national ratification were affected by clashing interests between physicians and diplomats, resulting in a long series of sanitary conferences for over 50 years until the establishment of the Office International d'Hygiène Publique in 1907.



The Permanent Committee of the Office International d'Hygiène Publique at its session in Paris in May 1933. Council on Foreign Relations.

National interests do not necessarily mean an impediment to international collaboration, especially when they align with wider geopolitical or economic goals. The political, military and economic interests of the United States of America underpinned efforts of the global malaria eradication programme in the 1950s (Cueto et al., 2019). At the same time, the return of the then-Soviet Union and changes in its internal politics in 1956 led to the initiation of WHO's successful smallpox eradication campaign (Manela, 2010).

Political frameworks and national and geopolitical concerns may affect the uptake of models and epidemic management structures globally. Interventions in epidemic management might be reframed or deemed politically problematic, making the standardization of models and practices across regions or political systems uneven. International pandemic management might be hesitant to embrace measures seen to be authoritarian (while often deemed to be effective epidemic management tools), due to concerns about political implications, as discussions at the first World Health Assembly demonstrated. Certain countries might resist prophylactic measures that are seemingly politically neutral (for example, effective vaccines and masks), as they fundamentally challenge established relationships between society and national governments. National or geopolitical concerns can also lead to “forgetting” successful models.

The combination of vertical and horizontal interventions – such as no-cost mass vaccination campaigns organized through universal urban and rural health-care systems – greatly contributed to early successes and vaccination model development that led to polio eradication in countries such as the Czech Republic (then known as Czechoslovakia) (1960) and Cuba (1964). The primacy of socialist countries’ contributions to polio eradication, however, was quickly “forgotten” due to the political environment of the Cold War, as only the vertical aspect of this public health intervention was retained in global eradication efforts (Vargha, 2018b).

International networks beyond international agencies or international nongovernmental organizations (iNGOs) can play important roles. When considering international

responses and planning for preparedness towards pandemics, the historical trajectories of international networks should be considered, as they cross over temporal and geographical boundaries that are often taken for granted. Scientists may take action as political agents to open spaces for collaboration otherwise impossible in a geopolitical climate (for example, convening of the Pugwash Conferences on Science and World Affairs in international nuclear affairs since 1957). Similarly, patient organizations can propel international awareness (for example, the role of organizations such as Act Up in the AIDS crisis). Colonial infrastructure, professional relationships (for example, training) and economic ties continue to affect transnational collaboration and international frameworks today. For instance, Christian missionary involvement in colonial rural public health has continued to shape the geography of disease control in many former colonial states, and impacted WHO policy-making and thinking through the 1970s (Cueto, 2004).

Many iNGOs that were developed in response to major health and subsistence crises, such as Médecins Sans Frontières and Concern, continue to be active advocates and supporters of systemic responses to epidemic and pandemic outbreaks today. Imperial metropolitan schools of public health still dominate infectious disease control and public health training across much of the world. These include institutions in Belgium, France, the United Kingdom of Great Britain and Northern Ireland, and the United States of America. Recognition of the impact of these historical patterns has led to prominent and increasing calls to decolonize institutions, networks, education and decision-making in global health.

THEME EIGHT

Political and social movements

Epidemics have played variable roles in triggering political and social movements.

Epidemics, precisely because they disrupt the social order, often ignite political movements. Sometimes they stoke existing unrest; sometimes whole new fissures open up between groups of people. Infectious diseases have individual characteristics, and they play out differently in the socioeconomic contexts in which they occur. Similarly, political movements or effects are specific to their context. They can be spontaneous or structured, orchestrated from above or driven by popular grievances, secular or religious, progressive or reactionary. Epidemics can be inflection points for making political decisions, but those decisions can be made by a range of political actors and cover the whole political spectrum. Diseases have been used to justify colonial conquest, pogroms and authoritarian assertions of religious, political and gender power. Conversely, they may in other cases have led to uprisings, rebellion and decolonization. In some circumstances, no significant political movements have resulted.

The scale of the mortality that epidemics unleash is not a reliable guide to their impact. The plague of Athens in 430–428 BCE during the Peloponnesian War, made famous by the historian Thucydides, destroyed half of the city's 300 000 residents with dire repercussions.



People in Geneva, Switzerland, display a banner during a demonstration calling for an intellectual property rights waiver on COVID-19 vaccines.

Athens lost the war against Sparta; the city abandoned its traditional gods; the populace turned against its democratic leader Pericles; and a wave of xenophobia targeted metics, immigrants from other city-states who lost the protection of citizenship amid a wave of anti-immigrant laws. In the 19th century, cholera caused a limited number of cases and deaths, but it went a long way towards transforming the nations it affected. And at the other end of the spectrum, the pandemic of 1918–1919 killed as many as 100 million people worldwide. Its societal impact, however, was small.

Epidemics can exacerbate pre-existing social divisions between groups, or not. The late medieval plague pandemic known as the Black Death caused perhaps the highest mortality levels in recorded history. In parts of Europe – Belgium, France, Luxembourg, the Kingdom of the Netherlands and the Rhineland – suspicion fell on Jews, who were accused of attempting to destroy Christendom by poisoning wells. Responses ranged from spontaneous attacks on local Jewish communities to the formal arrest, trial and murder of Jews on a scale that prefigured the 20th-century holocaust. Yet there were also Jewish minority communities throughout the Islamic Middle East and North Africa that experienced comparable mortality levels at the same time, with no indication of attacks or even suspicion of Jews. Instead, the plague was seen as a common threat to all, just as a drought would be.

Responses to epidemic conditions can provoke political upheavals. India was the epicentre of the Third Plague Pandemic at the end of the 19th century. Plague arrived in 1894 in Bombay (now Mumbai) and caused perhaps 30 million deaths before ebbing away in the 1920s. At first, British authorities, armed with new insights about the microbial cause of the disease, imposed a full

arsenal of draconian anti-plague measures. In so doing, they violated Hindu, Muslim and Parsee beliefs, customs of caste and gender, and traditional healing practices. Fearing British policies as much as plague itself, residents with means fled. Others resisted the medical teams, and scuffles escalated into riots. So strong was the anti-colonial sentiment that by 1896 the British Government yielded, replacing force with conciliation.

Differential susceptibility to a particular infectious disease may provide the contingent factor that determines the outcome of political shifts. By the 18th century, Saint-Domingue (now Haiti and the Dominican Republic) was the world's wealthiest colony and a major driver of French economic growth. The conditions of slave labour, however, made the island a place of misery and violence. A rebellion initiated by the enslaved populace in 1791 hung in the balance when Napoleon determined to restore slavery. In early 1803, he dispatched 60 000 troops to crush the revolt (Dubois, 2004). Yellow fever decimated the newly arrived Europeans. Many African slaves, in contrast, having already been exposed to the disease, possessed immunity. As a result, by summer 80% of Napoleon's men had perished and the convalescing remainder were unfit for duty. France surrendered, and Haiti became the first free Black republic and an early example of decolonization (Girard, 2011).

How a disease presents – not only its visible symptoms, but also the speed with which those symptoms present – plays a role in social reactions. But those reactions can vary widely.

A violent affliction with gruesome symptoms, cholera had long been endemic in India, but it could travel no further before the steamship and railroad transportation revolution. When cholera struck Europe in waves between the 1830s and 1911, it was famously associated with social revolts. In the first visitation, Russia, Prussia and the Habsburg Empire attempted to contain it by reviving the anti-plague measures initially created at the end of the Middle Ages to respond to plague: sanitary cordons, quarantine and lazarettos, all enforced by military means. The disease and the measures to suppress it engendered such violent resistance, however, that the nations of western Europe resolved to deploy other means. In the latter half of the century, a contrasting political movement emerged in the United Kingdom.



Edwin Chadwick led the sanitary movement in the 19th century in the United Kingdom.

Led by Edwin Chadwick (1843), the sanitary movement implemented a massive public works programme. The sanitarians retrofitted cities with an infrastructure of safe water supplies, sewers, water closets, paved streets and housing regulations. The twin goals were to prevent cholera and to remove the danger of riots, labour activism and revolution by cleansing, moralizing and Christianizing the working classes.

As COVID-19 advanced, the world was reminded that the political outcome of a pandemic is not predetermined by the virus. Rather, it is a matter of human moral choices. Multiple factors can influence the scale and nature of these responses, including:

- whether the disease is familiar;
- whether the disease is treatable;
- whether the symptomatology is dehumanizing;
- whether the epidemic passes rapidly;
- whether the disease targets specific ethnic or class groups;
- whether the disease severely disrupts the economic and social order; and
- the degree of trust a population has in political and health authorities.

THEME NINE

Getting the response right

Political legitimacy and epidemic containment and control are interlinked both in national and international spheres.

Political stability in past epidemics has been linked to authorities being seen as “getting it right”. Containing or controlling an epidemic by limiting transmission and mortality permits authorities – whatever their mode of governance – to claim a degree of legitimacy. The identification of epidemic control with political legitimacy makes it a valuable tool for newly established states, states with uncertain legitimacy or foreign powers seeking to increase their influence in a region. Mobilizing scientific expertise can serve assertions of authority in epidemic control. State and local administrations often claim not only political but also scientific authority in their efforts to establish legitimacy via epidemic control. This dynamic is shaped by public understanding and trust in science.



A worker refills a water tank at a COVID-19 vaccination hub in Davao City, Philippines, as part of the country’s public health response.



A WHO-coordinated cross-border field simulation exercise in response to a fictitious illness called East Rift Fever at a border area between Kenya and the United Republic of Tanzania in 2019.

Anticipated or recent political instability can motivate state investments in health and epidemic response. If controlling an epidemic can offer legitimacy, failing to control an epidemic or to offer welfare support in response can undermine it. Such failure can lead to political unrest and uprising. For example, in the 19th century, riots in cholera-stricken areas across Europe, Russia and North America targeted local authorities and the medical profession, and have been connected to contexts in which ruling elites ignored local beliefs and customs, imposed harsh but ineffective regulations, and met resistance with repression, especially of women and those of lower socioeconomic status.

One illustrative case in which the high stakes for successful epidemic control were recognized is that of Hungary in 1957, which faced a polio outbreak immediately after a traumatic and violent political crisis. The revolution of 1956 exposed failures in Hungary's health systems,

which motivated strong state investment and international cooperation in polio vaccination there the following year (Vargha, 2018a).

State control of information about epidemics has often stemmed from concerns about stability. Authorities may perceive information about epidemics to be a sensitive matter of state security, and this may interfere in efforts to share information about the spread of disease across borders. For example, when the 1918 influenza spread among the ranks of warring parties, the military censored reporting in the press for fear that it would hinder the war effort and be perceived as a weakness by the enemy.

Authorities have prioritized “getting it right” in epidemic response as a means of gaining prestige and goodwill in international relations. Perhaps the most obvious example of this international dimension of domestic success is the Smallpox Eradication Programme, which represented the successful Cold

War collaboration of global superpowers; individual nations' successful elimination of the disease demonstrated their participation in this scheme for the benefit of humanity. In another example, one response to SARS in China was the development of extensive health protocols for epidemic outbreaks in order to better identify and isolate outbreaks in the early stages. These new practices were demonstrated in China's swift response to the H1N1 pandemic in 2009; however, these intensive measures were perceived as an overreaction by the global health community (Mason, 2016). In this case, epidemiologists' actions demonstrated a "hygienic modernity" that was rejected by global audiences.

In order to be seen to have successfully controlled epidemics, authorities have denied, obfuscated and fabricated statistics and other kinds of public information. Such obfuscation occurred during cholera outbreaks in Naples at the turn of the 20th century when the state censored the press and threatened doctors and officials who drew attention to the disease; made "sanitary defeatism" a legal offence; refused therapeutic innovations that implied the presence of cholera; and falsified local and national statistics relating to causes of morbidity and mortality (Snowden, 1995). If discovered and publicized, these actions can result in an erosion of public trust and international goodwill.

Interaction between central and local governments and authorities creates an additional layer of complexity and can lead to harmful mistrust and a lack of coordination between institutions. Historically, there have been many examples of local authorities trying to obfuscate information about local epidemiological conditions in order to avoid actions from central governments perceived as harmful, as well as cases of state authorities trying to persuade local authorities not to enforce specific policies for pandemic management. For example, in early modern Italy, where default policies for plague containment included extended quarantines imposed upon entire cities and territories, state authorities could not rely on city governments to tell the truth about local outbreaks. Cities were prone to lying in order to avoid bans (city-wide quarantines) and the resulting damage to trade and local economic activity. At the same time, cities frequently introduced plague-motivated restrictions against other cities, against the recommendations of state authorities, contributing to confusion and general mistrust that hindered effective anti-pandemic coordination across the state (Alfani, 2013).

THEME TEN

Inequalities

Epidemics shine a light on inequalities and systemic discrimination. Disease dynamics, access to care, control measures and economic effects have a compounding and long-term impact.

Pandemics can both exacerbate inequalities that already exist in a society and create new kinds of inequalities. Inequalities by definition have health outcomes, since so much of health is tied to access to resources (for example, food, health-supportive living environments, medical care) and freedoms (for example, of movement, of leisure at will) that support healthy living. In addition to risks and disruptions that are widely spread across communities, disease events can also strike subpopulations in differential and sometimes extremely harsh ways – ways that can be largely invisible through standard mechanisms of data-gathering and observation. Outcomes can be death or for survivors significant redistribution of resources, thus impacting income and wealth inequality. The latter often persists past an individual's lifetime, resulting in longer-term, intergenerational effects of pandemic events.

Recent literature has argued for a levelling (that is, inequality-reducing) power of large-scale pandemics. This was the case for the Black Death, the plague pandemic that struck Europe and the Middle East in 1347–1352.



A mother and her child living in a settlement in Nouméa, New Caledonia, in 2017.



A woman tends her garden in Tuvalu.

The Black Death has been documented in Europe to have reduced wealth inequality as well as income inequality because the exceptionally high mortality rate made labour scarce and favoured increases in real wages (Alfani and Murphy, 2017; Scheidel, 2017). However, subsequent plagues in Europe – for example, those in the 17th century – were sometimes characterized by overall mortality rates not very different from the Black Death. Yet, they did not lead to a significant reduction in either wealth or income inequality. This was a consequence of different initial conditions, which included institutional innovations introduced in the centuries following the Black Death, specifically to protect the largest patrimonies from the undesired egalitarian effects of large-scale plagues (Alfani and Murphy, 2017; Alfani, 2020).

It would be misguided to assume that the inequality reduction that took place after one specific historic event – the Black Death – could be applied to the COVID-19 crisis. The 14th-century Black Death is the only

pandemic of pre-industrial times for which there is substantial evidence of significant and enduring inequality reduction. In fact, comparison with other historic pandemics suggests that short- and long-term economic effects can be varied, in part due to possible human interventions. In the early stages of the pandemic, it was expected that COVID-19, due to its epidemiological characteristics, would not cause a large-scale contraction of the labour force driven by high mortality. Instead, it was anticipated that the pandemic would probably lead to exceptionally high unemployment, especially among the poorest and most economically fragile groups; hence, it would almost certainly cause a significant increase in economic disparities. This view found support in recent research suggesting that the pandemic of 1918–1919 led to increases in income inequality (Galletta and Giommoni, 2020). This view was later reaffirmed by various studies, including the *World Bank's World Development Report 2022: Finance for an Equitable Recovery*, which states that “global poverty increased for the first time in

a generation, and disproportionate income losses among disadvantaged populations led to a dramatic rise in inequality within and across countries”.

Research suggests that, although certain populations have inherent heightened biological risks (by sex, age and race), overall these risks seem to be secondary to the social positioning of individuals in terms of occupation and wealth. Historical analyses show, for example, that although women faced higher biological risks of plague mortality during pregnancy (Fleck-Derderian et al., 2020), overall mortality did not seem to vary significantly by sex. Rather, the risk of mortality has been shown to be closely tied to occupation (Evans and Evans, 2019) and immigration status (Galanaud et al., 2020). Even for children, the circumstances of caretaking seem more important than physical age per se in determining risk.

The poor were usually hit the hardest. The poor suffered more than better-off groups not only because of their crowded living conditions and generally lower health status, but also because policies were introduced that actively increased their individual risk of infection and death. For example, during the early modern plagues in continental Europe, the poor, whose presence in a city was considered to be a factor favourable to the spread of the contagion, were expelled beyond the city walls or isolated in specific places, where they became easy prey for infection (Alfani and Murphy, 2017; Alfani and Bonetti, 2019).

Pandemics can be an opportunity for improving the conditions of the poorest and most fragile groups. During the 19th-century cholera pandemics, the poor were particularly prone to be affected. However, when it became

clear that cholera spread more efficiently in the most wretched and unhealthy urban areas, governments introduced public policies that led to significant improvements in the living conditions of the poorest strata, although these policies were often imposed in a top-down way and sometimes met with resistance (Baldwin, 1999).

Pandemics can exacerbate the damaging effects of gender hierarchies by compounding biological risk with cultural disenfranchisement. African American women were disproportionately affected by the HIV/AIDS epidemic of the late 20th century, not only because of their sex but also due to racial discrimination. They shared a risk with other women that sex-specific manifestations of AIDS might be clinically overlooked (most importantly, aggressive cervical cancer) and experienced unequal access to preventive and therapeutic education and care because of underlying social inequalities of health in the context of the health system of the United States of America. Recommendations for future HIV/AIDS prevention work have delineated the need to address these gaps (El-Bassel et al., 2009).

Preparedness planning reflects socially influenced values, assumptions and commitments, as such plans articulate what is considered worth protecting by a given society, government or group. Health inequalities of race/ethnicity, gender and class pose barriers to pandemic preparedness, given that such plans rely on existing health infrastructures. Consequently, recognizing the ways prior societies failed to interrogate their pre-existing structural inequalities – recognizing the ways certain groups’ needs are undervalued or ignored – may be a way in which historical cases can better inform preparedness planning in the future.

THEME ELEVEN

Community

During the first year of the COVID-19 pandemic with no vaccine or broadly effective therapy, responses to the disease drew on scientific understandings of biological immunity and differential risk.

However, it is important to be attentive to the historical construction of those concepts. COVID-19 presented the world with an emerging infectious disease problem, where neither a vaccine nor universally effective therapies were available. The challenge of emerging diseases (those caused by hitherto unknown pathogens) is trifold: (1) no one in any population has prior acquired immunity; (2) no vaccine exists; and (3) it is unknown whether or how long acquired immunity lasts in those who have been exposed, or what immune-related sequelae might result months or years later in survivors of an infection. During the first six months of clinical presentations, no existing medications had proven to be broadly efficacious.

COVID-19's stunning speed and nearly instantaneous global dissemination, coupled with the then absence of an effective vaccine or therapy, forced the world to wrestle with functional concepts of immunity – at both the individual and population levels. Those concepts have histories.



A child gets vaccinated against COVID-19 in the Federated States of Micronesia in December 2022.

COVID-19 emerged in a world where multiple axes of differentiation among populations were already operative. In the early months of 2020, it became readily apparent that COVID-19, though sparing children, was decimating older age cohorts (Williamson et al., 2020). Those differentials were likely grounded in biology. Additionally, it was understood that certain populations had inherited immune profiles that, because of historical exposures, gave them greater susceptibility or resistance to acute infectious diseases (Patin, 2020). However, the widely reported differentials in morbidity and mortality along the lines of “race” needed to be interrogated (Roberts et al., 2020). As an analytical category, the concept of “race” has a complicated history; the term is used imprecisely, collapsing phenomena that are both biological and socially constructed (Krishnan et al., 2020).

The Americas and former colonial metropolises have the world’s most genetically diverse populations as a result of five centuries of colonialism; examination of those contexts can reveal the formative construction of “race” in medical thinking and practice. As recognized by the 10th-century physician Rhazes, survivors of smallpox, a viral disease of Old World origin, were protected with lifelong immunity. By the 16th and 17th centuries, the empirically developed intervention of variolation had been independently developed both in China and in African countries (Green, 2018). Jennerian vaccination built on these insights and resulted in a far less lethal alternative intervention based on cowpox. However, global implementation of vaccination was not a uniform process, and it took nearly 200 years after Jenner’s innovation to bring smallpox under control (Bennett, 2020). Because all humans were susceptible to smallpox infection, variolation or vaccination was often made available in mixed communities

in slaving societies. However, following emancipation in the United States of America, at least 60 000 African Americans died of smallpox between 1862 and 1870 in part because Congress, through the Freedmen’s Bureau, which was in charge of providing health care to former slaves, funded neither isolation hospitals nor vaccination campaigns. For some in Congress, this was justified by their belief that spread of the disease in African American communities was a result of emancipation itself and the belief that the race was doomed to extinction anyway (Downs, 2012).

“Race thinking” in medicine is the product of a particular moment in colonial history. Two diseases brought to the Americas from the Old World – malaria and yellow fever – played a role in forming not only popular ideas about immunity, but also fundamental scientific and medical ideas about “race”. Although both diseases produced comparable mortality levels to smallpox, immune-based interventions were not developed for either of them prior to the 20th century. With yellow fever, in particular, the only option to living with the impending risk of an outbreak was to deliberately seek out exposure, in the hopes of becoming “acclimated” or “seasoned” (Olivarius, 2019). Yet early ideas about the equal effects of tropical climates gave way to racialized notions of immunity that science and medicine wrestle with to this day (Seth, 2018).

COVID-19 has emerged amid understandings of human immune processes that did not exist even 40 to 50 years ago when smallpox was eradicated. It is well known that neither Jenner in the late 18th century, nor Pasteur (who developed the rabies vaccine) in the late 19th century, actually understood the physiological processes of immune response that their vaccines induced. Modern immunology has



A workshop to engage communities in maternal and early child care and vaccination in 2023 in the Lao People's Democratic Republic.

mostly been a product of the latter half of the 20th century, particularly since HIV/AIDS revealed the many ways the immune system could be compromised. The newest science of immunity – genetics – shows that immune processes are not binary (either on or off) but additive and complex, changing over the course of an individual's life. One lingering historical puzzle was why the 1918 flu was so lethal to otherwise healthy young adults. It was suggested that it was due to that age cohort's exposure in childhood to a different strain of flu, which left them particularly vulnerable to the new H1N1 strain in 1918 (Worobey et al., 2014).

Developments in immunology have likewise brought new insight about measles. Once believed to be a “mild” disease, measles has the potential to “reset” an individual's

immune system, compromising other acquired immunities (Mina et al., 2019). COVID-19 likewise seems to challenge the immune system and has already been implicated in a condition in children – paediatric inflammatory multi-system syndrome temporally associated with SARS-CoV-2, the virus that causes COVID-19 (Davies et al., 2020).

The complexity of immune responses thus raises real questions about whether any traditional associations of “race” that have made their way into medical thinking (and which carry forward elements of the racist contexts in which they were formed) have validity in making sense of this more recent disease threat.

The COVID-19 pandemic put a new burden on definitions of “community” in that it was the first time in history the entire world had been united in a pandemic event simultaneously, watching its global impact in real time. Popular ideas about immunity existed before COVID-19's arrival, and they will shape responses going forward. For example, vaccination hesitancy was widespread before 2019. The idea that exposure to relatively mild pathogens “strengthens” the immune system fuelled the idea that COVID-19 was a disease that otherwise healthy populations could endure – that “herd immunity” could be achieved with little cost in lost lives. Yet herd immunity is itself a concept that developed within the context of available vaccines. A historical perspective reveals how medical concepts of immunity have been formed within the prism of sometimes incompatible or illogical ideas about disease risk. Better understanding of the genesis of these ideas allows recognition of the continuing effects of historical inequalities in populations hit by COVID-19.

THEME TWELVE

Innovation

Innovation in response to epidemic outbreaks has taken many forms and is contingent upon social and political contexts.

Innovation is often expected to be quick and transformative, but many important innovations in epidemic response and control have taken place over a long period. Consideration of past epidemics suggests three kinds of innovation: simple technologies developed in moments of crisis, previous technologies redeployed and systems-level developments.

Simple and effective technologies may be developed in moments of crisis amid a number of innovations. For instance, during the 1910–1911 Manchurian plague, the physician Wu Lien Teh advocated for people to use face masks in response to the failure of a different tool – the microscope – to prove definitively that the transmission was airborne. Yet the masks were only adopted after they were stamped with local temple seals, revealing the need to consider how new technologies take on local meaning and encounter acceptance or resistance (Lynteris, 2016).



A migrant worker uses a tele-kiosk to speak to a doctor at a migrant worker dormitory in Singapore during the COVID-19 pandemic.



A medical doctor touches an electronic medical projection on a screen with a hologram of a human.

Systems-level innovations have the potential to have a profound impact on health and health systems. Such large-scale systems draw on a number of different technologies, incorporate scientific research and structures and can involve numerous organizations. Hospitals, in their particular concatenation of therapeutic methods, diagnostic technologies and social care, can provide an example of such systems-level innovation. The plague hospital and associated systems of quarantine constitute a historically contingent model invented in the crucible of epidemic crisis in medieval and early modern Europe (Stevens Crawshaw, 2016). Within the hospital, the intensive care unit is itself a systems-level innovation that arose from the crisis created by polio epidemics in the mid-20th century, which left many patients in need of prolonged nursing care and infrastructures to support novel ventilator technologies (Reisner-Sénélar, 2011).

However, the selective or uneven implementation of systems-level innovations can expose societal inequalities. For instance, sanitary reforms carried out in the United Kingdom in the 19th century were not applied to its colonies, where efforts to establish sanitary infrastructure foundered without sufficient funding or support.

International health itself may be thought of as a systems-level innovation. Starting from 1851, a series of international sanitary conferences were convened, and representatives from a number of polities discussed means of preventing cholera, plague, yellow fever and other infectious diseases from crossing national and imperial borders. The conferences brought together the medical profession with diplomatic and governmental interests to attempt to regulate quarantine and epidemic prevention practices.

A number of organizations and networks arose in the wake of these conferences, unified by the goal of preventing epidemics that crossed borders and fostering international cooperation through aid in public health. These groups also sought to meet the need for standardization and regulation arising from systems-level interventions. For instance, one of the functions of the Health Organisation of the League of Nations in the early 20th century was to define global standards for vaccines, sera and other biological products.

Some innovations draw on and combine several of the categories outlined above. It is entirely possible for simple technologies developed in moments of crisis to play a role in the development of broader, systems-level innovations. Immunization provides a good example of the complex interplay of innovation that might arise out of an epidemic crisis: it is not only vaccines that are important, but also the support systems that underlie immunization, including refrigeration, standards for ampoules and glass, needles, and the clinical methods and skills associated with the act of immunization. In China, vaccination systems were established over several decades

and government regimes in the 20th century; they have played a key role in epidemic preparedness as well as response (Brazelton, 2019). Preparedness planning thus requires consideration of the material requirements of epidemic prevention and control and draws on innovations emerging from past epidemics at all the levels outlined.

Innovations may have serious impacts on the environment. For example, innovations such as pesticides used to control or eradicate malaria, yellow fever and other vector-borne diseases included fumigation of indoor structures with dichlorodiphenyltrichloroethane (DDT) and other harmful chemicals, as well as extensive outdoor spraying. The use of DDT was highly controversial because of its potentially devastating impact on the environment and its use as a form of “soft power” to demonstrate the potential of American technology during the Cold War. Yet DDT also acted as a catalyst for an environmental movement in the United States of America. Other innovations included infrastructural transformations such as draining of swamps, irrigation of fields, application of screening to homes and use of bed nets, both treated and untreated.

Environment



A man in Viet Nam, wearing a protective mask, rides past a billboard on COVID-19 prevention in April 2020.

Epidemics reshape societies' relationships with the environment. They can change the way societies use, exploit and protect the environment, including cities and the built environment.

Throughout recorded history, **epidemic disease has been an index for human relations with the environment**, and it has sharpened attention to changes in these relations. Epidemic outbreaks often crystallize in conditions of ecological stress, forcing people to make imaginative social, technical and political adaptations to changed and newly threatening surroundings. The burden of adaptation often falls unevenly across different groups of people due to existing inequalities in resources and labour allocation and access. Ecological stress is felt more keenly in low-resource settings, by minority or dispossessed groups, colonized populations and by women, as is evidenced by histories of disease burdens (for example, malaria and tuberculosis).



A contemporary engraving depicting Marseille during the Great Plague in 1720 by Michel Serre (1658–1733), displayed at the Museum of Fine Arts in Marseille, France.

Epidemic and pandemic disease has regularly threatened humans' ability to sustainably coexist with the non-human world (Bonneuil et al., 2016). This relationship is deeply rooted in historical responses to disease. When the second cholera pandemic swept across the interconnected world of early 19th-century imperialism, commerce and industrialization, it fed into existing concerns about the health of rapidly growing European cities.

It pitted contagionist pro-quarantine responses against broadly anti-contagionist sanitarian theories that industrial squalor and dirt, rather than individual infectious transmission, were responsible for pandemic disease (Harrison, 2020). For sanitarian reformers such as Edwin Chadwick in London, there were economic opportunities in investing in urban waste management for fertilizer (Hamlin, 1985), alongside British unwillingness to limit trade through quarantine. This sanitarian impulse, harnessing vested economic interests with powerful public health rhetoric, has continued to influence the urban built environment to this day.

Perhaps the most concerning aspect of the altered relationship between humans and the animal world is the **evermore frequent emergence of zoonoses** – animal diseases that cross the species barrier separating wild animals and humankind. As loggers, miners, palm oil plantations and farmers destroy animal habitats and poachers and hunters invade it, displaced animal species such as bats are forced from their environmental niches into increasingly frequent contact with humans in ways that seldom or had never occurred before. The “spillover” of microbes to which humans have no immunity is the source of epidemic diseases such as SARS, Nipah virus disease, Marburg disease, Middle East respiratory syndrome (MERS), Ebola virus disease and now COVID-19 (Letko et al., 2020).

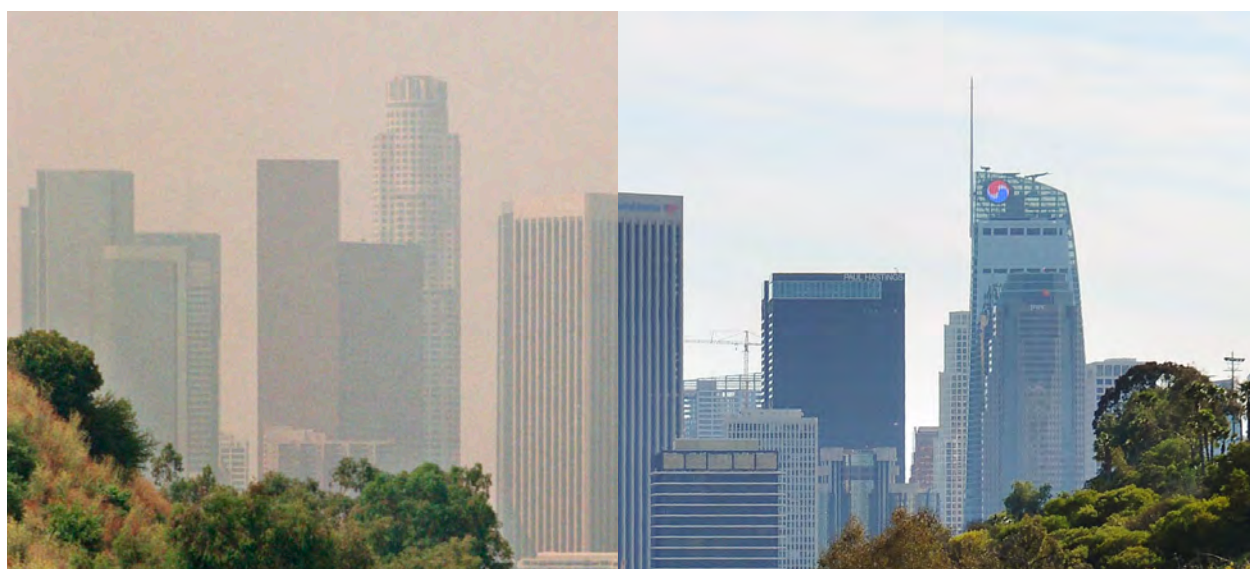
The human toll of disease has often undermined social systems, such as agricultural technology, border landscapes and urban infrastructure. In the wake of catastrophic disease outbreaks, with a high toll on mortality and/or morbidity, labour markets and maintenance cultures often endure

intolerable stress, including a breakdown in the political technologies that preserve records of past environmental management strategies. The recent rediscovery of large-scale, coordinated anthropogenic soil and forest management strategies in the pre-Columbian Amazon basin – a cultural zone so completely devastated by new disease introductions (most famously, smallpox) following European military invasions that the record of the technologies and operation of the systems were considered lost – indicates the scale of the unravelling of ecological management and stewardship that can follow in the wake of epidemic disease (Neves et al., 2003).

Similarly, the maintenance of flood systems in the lower Nile Basin (present-day northern Egypt) collapsed during the 14th and 15th centuries in the aftermath of the Second Plague Pandemic (Borsch, 2014), while a series of interlocking though independent human and animal trypanosomiasis epidemics and zoonotic outbreaks fundamentally reconfigured environmental control strategies developed and deployed in the Congo Basin,

African Great Lakes and Zambesi Basin areas of southern and central Africa in the early 20th century (Ford, 1971; Lyons, 1992; Mavhunga, 2018).

Shocks to human accommodation with the non-human world can be experienced as a judgment on our ways of living. Humans have responded to these shocks in a wide variety of ways, all of which leave an impact on our cultural adaptation to pandemic crises. The impact of the Second Plague Pandemic in late medieval Europe on the relationship between religion, community and the state has been well documented (Roosen and Green, 2020), and environmental, pandemic and epidemic upheavals have often given rise to crises in religion and healing, as evidenced by prophetic and millenarian movements in southern and central Africa in response to influenza and human trypanosomiasis in the early 20th century (Lyons, 1988; Ranger, 1988). However, these shocks have also focused attention on the potential to change and reorder our relationship with the environment and the ecological impact of increasingly dense and resource-intensive urbanization.



The sky above Los Angeles before and after the pandemic. Many cities experienced reductions in air pollution during COVID-19 lockdowns.

THEME FOURTEEN

Economy

Historically, economic recovery after major pandemics is uneven and compounds inequities at the national and subnational level. Women may suffer significantly greater economic damage compared to men.

Major historical pandemics had major economic consequences. In the short run, the consequences were invariably very negative, but a few pandemics seem to have had positive consequences in the long run. The best example is the Black Death, which led to a useful reorganization of agrarian production towards greater efficiency, a significant increase in real wages, a rebalancing of population and available resources, and a reduction in economic inequality. However, this “positive” narrative of the Black Death is nuanced, as in some areas the long-run economic consequences of the pandemic were negative (Alfani and Murphy, 2017). In relatively under-populated areas, such as Ireland and Spain, the Black Death set economies on a lower path of development.

In Spain, it destroyed the equilibrium between a scarce population and abundant resources upon which a prosperous trade-oriented “frontier economy” had been built (Álvarez-Nogal et al., 2020). Some densely populated areas of the Mediterranean were also negatively affected by the Black Death.



A cyclist in Cambodia shares donated food and supplies during the COVID-19 pandemic.

In Egypt, where high population density was required to maintain a very complex irrigation system, the pandemic destroyed 40% of the population. When adequate maintenance of the hydraulic system proved impossible, the irrigation capacity started to deteriorate and finally collapsed (Borsch, 2014; Alfani and Murphy, 2017). Populations in both Egypt and Spain suffered because of the Black Death but for different reasons, and probably not because of higher-than-average mortality rates as both regions seem to have experienced lower-than-average pandemic mortality.

A crucial point is that the economic shock caused by the most severe pandemics of the past proved asymmetric because of the differing initial conditions. The case of the last large-scale plagues affecting Europe in the 17th century is again one of asymmetric economic consequences in the long run. Indeed, as those plagues more severely affected southern Europe (especially Italy) at a time of particularly intense international competition, they contributed in a decisive way to the relative decline of southern Europe compared to northern Europe (Alfani, 2013; Alfani and Percoco, 2019).

Care must be taken when drawing comparisons between major preindustrial pandemics and COVID-19, but one lesson remains: the economic consequences of pandemics are very difficult to foretell. The history of plagues shows that severe pandemics can deeply affect economies, and that their consequences can be persistent and felt for centuries. However, these consequences depend to a large degree upon mortality rates – the higher the percentage of the overall population dies, the more severe the economic consequences usually are – and these were proportionally larger than expected for COVID-19. This condition of uncertainty

about who would suffer the worst economic consequences from COVID-19 may have made the case for international cooperation and solidarity stronger.

In modern times, the economic consequences of the pandemic of 1918–1919 are the object of debate, but damage to gross domestic product (GDP) seems to have been short-term only. Most of the academic literature argues for relatively limited and quickly dissipated (hence, short-term) effects of the 1918–1919 pandemic, which would have then caused a recession in which the economy suffers a sharp but brief period of economic decline followed by a strong recovery (Barro et al., 2020; Carillo and Jappelli, 2020). However, the 1918–1919 pandemic is a particularly complex case to analyse, as it affected economies that were still highly perturbed by the First World War. It was followed by very troubled years, and much of the data available (for example, regarding national or regional mortality rates) are somewhat imprecise. Additionally, as in the case of the Black Death, generalizing from one pandemic to another should be conducted with caution. Beyond some epidemiological similarities (for example, in terms of high diffusibility), the case of COVID-19 is entirely different from that of the 1918–1919 pandemic, not least because in the short term, most of the damage to the economy was caused by policies for pandemic containment that were applied on an unprecedented scale.

The 1918–1919 pandemic might have had more insidious and long-lasting consequences on economically relevant aspects of human behaviour. Beyond the (debated) consequences for GDP, the influenza pandemic might have had more insidious economic consequences in the long run; for example, by leading to a permanent reduction in interpersonal trust (a key component of social capital), especially



A woman buys fruits at a supermarket in Vanuatu.

in those countries that had experienced an institutional and societal failure in managing the pandemic (Aassve et al., 2020). If the 1918–1919 pandemic had negative economic consequences because of how it altered human psychology and behaviour, this would suggest that costly policies for COVID-19 pandemic containment might help to prevent decades of higher economic costs after the crisis.

The HIV/AIDS pandemic had a profound multidimensional impact on household and national economies in sub-Saharan Africa. HIV/AIDS led to the loss of labour power, impoverishment at the household level, shifts in the gendering of labour inputs, increased out-of-pocket health expenses and the intergenerational transmission of economic risk and vulnerability. Agricultural output, industrial competitiveness, and welfare spending and provision were all affected in economies and countries already under great stress from debt and funding crises compounding through the late 1970s and 1980s. These impacts have continued to reverberate as a long tail of the pandemic (Nketiah-Amponsah et al., 2019).

In past pandemics, women experienced different economic consequences than men. Sometimes, women might have been relatively advantaged by the post-pandemic situation. For example, it has been hypothesized that in northern Europe the growth in labour demand triggered by the Black Death led many women to enter the labour market, with positive and enduring consequences for the balance of power between genders and increased economic independence for women. However, recent research in the United Kingdom suggests that after that same pandemic, the real wages of men grew while those of women stagnated, increasing gender inequality (Humphries and Weisdorf, 2015). In general, it seems probable that women suffered more than men in most historical pandemics due to a more fragile economic position before the crisis coupled with their traditional role of family caregivers. For example, after the Zika crisis of 2016, poor women had the highest probability of having a special needs child, which often required them to quit jobs to provide care (Diniz, 2017).



A medical worker in the Republic of Korea conducts a COVID-19 test at a screening centre.

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WHO Western Pacific Region
PUBLICATION



ISBN-13

978 92 9062 047 1