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1. Ends of Epidemics

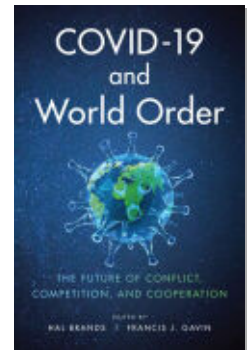
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Ends of Epidemics

Jeremy A. Greene and Dora Vargha

We know a good deal about beginnings: those first signal cases of pneumonia in Guangdong, influenza in Veracruz, and hemorrhagic fever in Guinea, respectively marking the origins of the SARS outbreak of 2002–4, the H1N1 influenza pandemic of 2008–9, and the Ebola pandemic of 2014–16. Recent history tells us a lot about how epidemics unfold, outbreaks spread, and how they are controlled before they spread too far. These stories only get us so far, however, in coming to terms with the global crisis of COVID-19. In the first few months of 2020 the coronavirus pandemic blew past most efforts at containment, snapped the reins of case-detection and surveillance across the world, and saturated all inhabited continents. To understand possible endings for this epidemic, we must look back much further indeed.

Historians have long been fascinated by epidemics, in part because they tend to form a similar sort of social choreography recognizable across vast reaches of time and space.¹ Even if the causative agents of the Plague of Athens in the 5th century BCE, the Plague of Justinian in the 6th century CE, the 14th-century Black Death, and the early 20th-century Manchurian Plague were almost certainly not the same

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thing, biologically speaking, the epidemics themselves share common features that link past actors to our present-day experience. “As a social phenomenon,” historian Charles Rosenberg argues, “an epidemic has a dramaturgic form. Epidemics start at a moment in time, proceed on a stage limited in space and duration, following a plot line of increasing and revelatory tension, move to a crisis of individual and collective character, then drift towards closure.”² Rosenberg wrote these words a decade into the North American HIV/AIDS epidemic, a moment whose origin was assiduously, perhaps overzealously, being traced to a “Patient Zero,” but whose end was, like the present condition, nowhere in sight.

As the coronavirus seeped further as an all-too-visible stain in the fabric of our society, we saw an initial fixation on origins give way to the more practical question of endings. In March, *The Atlantic* offered four possible “timelines for life returning to normal,” all of which depended on the biological basis of a sufficient amount of the population developing immunity (perhaps 60%–80%) to curb further spread.³ This confident assertion derived from models of infectious outbreaks formalized by epidemiologists such as W. H. Frost a century earlier.⁴ If the world can be defined into those susceptible (S), infected (I), and resistant (R) to a disease, and a pathogen has a reproductive number R_0 describing how many susceptible people can be infected by a single infected person, the end of the epidemic begins when the proportion of susceptible people drops below $1/R_0$, meaning that one person would infect, on average, less than one other person with the disease.

These equations reassure us that a set of natural laws give order to the cadence of calamities. The curves they produce, which in better times belonged to the arca of epidemiologists, are now common figures in the lives of billions of people learning to live with contractions of civil society promoted in the name of “bending,” “flattening,” or “squashing” them. At the same time, the smooth lines of these curves are far removed from jagged realities of the day-to-day experience of an epidemic. The textbook model of infectious disease modelling presents the epidemic as a quasi-biological function determined by a contagion parameter, R_0 , inherent to the infectious agent in question: seasonal influenza has an R_0 of 1.3, Ebola has an R_0 of 2, where a more contagious disease like chikungunya has an R_0 greater than 4, and measles literally explodes through populations with an R_0 between 11 and 18.⁵ Yet this only tells part of the story.

Epidemics are not merely biological phenomena. They are also always inevitably shaped by our social responses to them, from beginning to end. The question now being asked of scientists, clinicians, mayors, governors, prime ministers, and presidents around the world is not merely “when will the biological phenomenon

of this epidemic resolve?” but rather “when (if ever) will the disruption to our social life caused in the name of coronavirus come to an end?” As the peak incidence appears to have passed in some locations but looms larger in others, elected officials and think tanks from opposite ends of the political spectrum provide “road maps” and “frameworks” for how an epidemic that has shut down economic, civic, and social life in a manner not seen in at least a century might eventually recede and allow resumption of a “new normal.”⁶

These two versions of an epidemic, the biological and the social, are closely intertwined but they are not the same. Yes, the biological processes that constitute the epidemic can shut down daily life by sickening and killing people. But the social responses that constitute the epidemic also shut down daily life by overturning basic premises of sociality, economics, governance, discourse, and interaction—while also killing people in the process. There is a risk, as we know from both the Spanish influenza of 1918–19 and the more recent swine flu of 2009–10, of relaxing social responses before the biological threat has passed.⁷ But there is also a risk in misjudging a biological threat based on faulty models and overresponding or disrupting social life in such a way that the restrictions can never properly be taken back.⁸ We have seen in the case of coronavirus the two faces of the epidemic escalating on local, national, and global levels in tandem. But the biological epidemic and the social epidemic don’t necessarily recede on the same timeline.

History reminds us that the interconnections between the timing of the biological epidemic and the social epidemic are far from obvious. In some cases, when the epidemic disease itself is so clearly marked as abnormal, like the dramatic features of yellow fever or cholera in the 18th and 19th centuries or the classic presentation of the Spanish influenza in the early 20th century, the end of the epidemic may seem relatively clear. Like a bag of popcorn popping in the microwave, the tempo of visible case-events begins slowly, escalates to a frenetic peak, and then recedes, leaving a diminishing frequency of new cases which eventually are spaced far enough apart to be contained and then eliminated. In other cases, however—and here the polio epidemics of the 20th century are perhaps a more useful model than influenza or cholera—the disease process itself is hidden, threatens to come back, and ends not on a single day but at different timescales and in different ways for different people.

Campaigns against infectious diseases tend to be discussed in military terms and work with the assumption that both epidemics and wars must have a singular endpoint. We approach the “peak” as if it were a decisive battle like Yorktown

or Waterloo or Appomattox Court House, or a diplomatic arrangement like the Armistice at Compiègne in November 1918. Yet the chronology of a single, decisive ending is not always true even for military history. More than three months separated the end of the Second World War in Europe formalized by “V-E Day” from the end as experienced in the broader Pacific Theater as “V-J Day,” let alone the end as experienced by Teruo Nakamura, the last Japanese soldier to lay down arms in 1974, after nearly 30 years of hiding in a remote island in the Philippines.⁹ For occupied countries like Japan, Germany, and Austria, the end of the war had a different temporality as well. By the time Austria signed a World War II peace treaty in 1955, the Korean War’s military operations had already ceased after a 1953 armistice, yet there is still no peace treaty between North and South Korea.

Just as the clear ending of a military war does not necessarily bring a close to the experience of war in everyday life, so too the containment of a biological agent does not immediately undo the social impacts of an epidemic. In the course of World War II, historians have calculated that sixty million people were displaced in Europe alone, among them Holocaust survivors, prisoners of war, refugees, and deportees.¹⁰ Two years later, there were still close to a million people stranded in displaced persons camps, the last of which closed only in 1959. Returning to “normal” life for people in their home countries also took time: rationing food in Britain went on until 1954, nearly a decade after the last military battle.¹¹ So, too, were the social and economic effects of the 1918–19 pandemic felt long after the end of the third and putatively final wave of the virus—even if explicit conversations about the pandemic seem to have been swiftly “forgotten.”¹² While the immediate economic effect on many local businesses caused by shutdowns appeared to have resolved in a matter of months, the effects of the epidemic on labor-wage relations were still visible in economic surveys in 1920, again in 1921, and in several areas of the economy as far out as 1930.¹³ Some economic historians have argued that there was an even longer-term effect, detectable through generations: the Spanish flu’s negative impact on social trust, which in turn influenced long-term economic development.¹⁴

Like the First World War with which its history was so closely intertwined, the influenza pandemic of 1918–19 appeared at first to have a singular ending. In individual cities, the epidemic often produced dramatic spikes and falls in equally rapid tempo. In Philadelphia, as John Barry notes in *The Great Influenza*, after an explosive and deadly rise in October 1919, which crested at a death rate of 4,597 people a week by the middle of the month, cases suddenly dropped so precipitously that by the end of the month the public gathering ban was lifted, and two weeks

after that there were almost no new cases. Like any part of a materially determined universe, Barry describes, “the virus burned through available fuel, then it quickly faded away.”¹⁵

And yet as Barry reminds us, scholars have since learned to differentiate at least three different sequences of epidemics within the broader pandemic. The first wave blazed through military installations in the spring of 1918, the second wave caused the devastating mortality spikes in the summer and fall of 1918, and the third wave began in December 1918 and lingered long through the summer of 1919. Some cities, like San Francisco, celebrated the success of their public health measures after passing through the first and second waves relatively unscathed only to be devastated by the third wave. Nor was it clear to those still alive in 1919 that the pandemic was over after the end of the third wave. In 1920 eleven thousand influenza related deaths took place in New York City and Chicago. Even as late as 1922, a bad flu season in Washington State merited a response from public health officials to be “dealt with the same as influenza . . . enforce absolute quarantine.”¹⁶ It is difficult, looking back, to say exactly when this prototypical pandemic of the twentieth century was really over.

Who can tell when a pandemic is over? Strictly speaking, only the World Health Organization (WHO) can. The Emergency Committee of the WHO is responsible for the global governance of health and international coordination of epidemic response. After the SARS coronavirus pandemic of 2002–4, this body was granted sole power to declare the beginnings and endings of Public Health Emergencies of International Concern (PHEICs). While SARS morbidity and mortality (roughly 8,000 cases and 800 deaths in 26 countries) is already dwarfed by the sheer scale of COVID-19, the pandemic’s effect on national and global economies prompted revisions to the International Health Regulations in 2005, a body of international law that had remained unchanged since 1969.¹⁷

Perhaps the most fateful step implemented in the wake of SARS was the decision to expand the declarative powers given to the World Health Organization in the 2005 revisions to the International Health Regulations. This revision broadened the scope of coordinated global response from a handful of diseases to any public health event which the WHO deemed to be of international concern and shifted from a reactive mechanism to a proactive one based on real-time surveillance and from action at borders to detection and containment at the source.¹⁸ Any time the WHO declares a public health event of international concern—and frequently when it chooses *not* to declare one—the event becomes a matter of

front-page news. The World Health Organization has been criticized both for declaring a PHEIC too hastily (as in the case of the H1N1 pandemic) or too late (in the case of the Ebola pandemic).

The termination of a PHEIC is rarely subject to the same public scrutiny as its initiation. When an outbreak previously known as a PHEIC is no longer classified as an “extraordinary event” and no longer is seen to pose a risk of international spread, the PHEIC is simply considered unjustified, leading to a withdrawal of international coordination. In most of its day-to-day operation, the World Health Organization acts to support the actions of its constituent ministers of health, rather than perform any function like a supranational executive agency. Once countries can grapple with the disease within their own borders under their own national frameworks, it is presumed that international coordination is no longer needed, and the PHEIC is quietly de-escalated.

Yet as the response to the 2014–16 Ebola outbreak in West Africa has shown, the act of declaring the end of a pandemic can be just as powerful as the act of declaring its beginning, and a return to “normal” can indeed exist alongside the continuation of an emergency. When, in March 2016, WHO director-general Margaret Chan announced that the Ebola outbreak was no longer a public health event of international concern,¹⁹ the pronouncement had significant consequences on international, national, and local levels. International donors no longer saw it justified to provide funds and care to the West African countries devastated by the outbreak, even as these struggling health systems continued to be stretched beyond their means by the needs of Ebola survivors. On a local level, for those struggling with physical and mental health consequences and for Ebola survivors and their families and communities traumatized by the epidemic, it was hardly over. The official ending of the epidemic also caused concern beyond the national contexts: international nongovernmental organizations feared that the end of an international emergency would hinder work and collaboration on vaccines, which were still under development at the time.²⁰

Part of the reason that the role of the WHO in proclaiming and terminating the state of pandemic is subject to so much scrutiny is that it *can* be. Unlike other major global health funders, such as the Bill & Melinda Gates Foundation or the Wellcome Trust, who are accountable only to themselves, the WHO is the only international health agency that is accountable to every government in the world and contains the health ministers of every nation within its parliamentary body, the World Health Assembly. Since its foundation in 1948, the organization has been crucial in coordinating a response, making recommendations, and directing

efforts in epidemic management. Its authority is not mainly based on its battered budget, but its access to epidemic intelligence and pool of select individuals, technical experts with vast experience in epidemic response. And yet, even though acknowledgement of this scientific and public health authority is key to its role in pandemic crises, ultimately the WHO's recommendations are carried out in very different ways and on very different timescales in different countries, provinces, states, counties, and cities.²¹

We can already see, tracking epidemic curves across the globe through our daily consumption of news, that the timeline of epidemics plays out in differing ways in various countries. One state might begin easing up restrictions to movement and industry, while another is about to enact more and more stringent measures, as case fatalities increase by the day. As international air travel has come to nearly a complete stop and global production and distribution networks have halted, or at least significantly reduced, the flow of goods, we are reminded daily by the lack of ties that connect us to the rest of the world that the end of an outbreak in one community, one nation, or one continent will not mean the end of the epidemic. While the cutoff may seem universal, the reconnection will show extraordinary local variance.

Many believe that the end of COVID-19 will simply arrive with the development of a vaccine. Yet a closer look at one of the central vaccine success stories of the 20th century shows that technological solutions rarely offer resolution to pandemics on their own. Contrary to our expectations, vaccines are not universal technologies. Vaccination practices and the infrastructures in place to deliver them are as diverse as the epidemic management strategies national governments follow. They are always deployed locally, with variable resources and commitments to scientific expertise.²² This is nowhere more visible than in the management of polio epidemics that wreaked havoc across the globe in the 1950s.

The development of the polio vaccine is a relatively well-known story, usually told, as much of the history of polio, as an American one.²³ However, the 1950s saw polio epidemics sweep over the globe with no regard for borders, or even the Iron Curtain, and in many ways it united the politically divided Cold War world with a common goal. Locked in a conflict that would go on for decades, antagonistic superpowers were provided a safe haven by the disease in which they could meet and collaborate. A myriad of publications, scientists, and specimens crisscrossed the globe in an effort to share experiences and research in prevention and treatment. In a couple of years following the licensing of Jonas Salk's vaccine in the

United States, the use of the inactivated vaccine became widely used across the world. It did not work, however, in certain settings, or at least not as well as governments and scientists hoped.²⁴ This uncertainty with efficiency gave way to the mass testing of another live, oral vaccine developed by Albert Sabin, who collaborated in the final stages with Eastern European and Soviet colleagues, primarily Mikhail Chumakov. The successful Soviet polio vaccine trials became a rare landmark of Cold War cooperation, which prompted Basil O'Connor, speaking at the Second International Conference of Live Poliovirus Vaccines in 1960, to state that "in search for the truth that frees man from disease, there is no cold war."²⁵

Yet the differential uptake of this vaccine retraced the divisions of Cold War geography. The Soviet Union, Hungary, and Czechoslovakia were the first countries in the world to begin nationwide immunization with the Sabin vaccine, soon followed by Cuba, the first country in the Western Hemisphere to eliminate the disease.²⁶ By the time the Sabin vaccine was licensed in the United States in 1963, much of Eastern Europe had done away with epidemics and was largely polio-free. The successful ending of this epidemic within the communist world was immediately held up as proof of the superiority of their political system.

Did the authoritarian nature of these regimes make them uniquely capable of ending polio epidemics? This question can be seen reflected in current debates over the heavy-handed interventions in Wuhan this year. Yet it was also being asked in 1948, in one of the first meetings of the freshly minted WHO.²⁷ After a devastating war with fascist dictatorships, and in the growing shadow of the Cold War, the invocation of authoritarian measures was uncomfortable, to say the least, but its necessity was widely acknowledged. Furthermore, it was the military-like organization of the Soviet health care system that Dorothy Horstman, Yale virologist and WHO envoy, emphasized in support of the validity of the Soviet vaccine trials.²⁸ Such a regime was well placed to organize and efficiently deliver the venture.

What united the Cold War East was not only authoritarianism and heavy hierarchies in state organization and society. It was also a shared belief in the integration of politics and health as a particular imagination of modernity, in a combination of a paternal state, biomedical approaches, and social and socialized medicine. Regardless of the availability of resources and how far the achievements of health care were from its goals, epidemic management in these countries combined an overall emphasis on disease prevention, relatively easily mobilized health workers, top-down organization of vaccinations, and the rhetoric of solidarity, all resting on a health care system that aimed to provide access to all citizens. However

imperfect, vertical and technocratic interventions of vaccination met with horizontal infrastructures of health and social care.²⁹

Authoritarian measures, then, are not sufficient, nor are they necessarily as beneficial as one might imagine. Alternative solutions, built on compassion and solidarity and coupled with adequate provisions, might ease and even remove tensions that often run high in epidemic contexts. Historian Samuel Cohn has examined the example of the cholera outbreak in Berlin in 1831, where authorities focused on assistance and negotiations instead of harsh clampdowns, establishing soup kitchens for the unemployed and care for the orphans of victims.³⁰ As a result, Berlin became unique in avoiding cholera uprisings, which swept across German cities and much of Europe at the time. There are other examples: in early modern Florence during a plague outbreak, its health board, the Sanitá, combined heavy-handed measures with punishment for whoever violated quarantine measures (for instance by dancing), and at the same time provided food and medicine to all inhabitants.³¹ The assumption was that an insufficient diet, especially among the poor, would contribute to their vulnerability to the disease, therefore they received daily and weekly packages of bread, wine, sausages, cheese, and herbs. The overall death toll in Florence remained significantly lower than other Italian cities (around 12% as opposed to up to 61%) by the time the epidemic ended.

Still, authoritarianism as a catalyst for ending epidemics can be singled out and pursued with long-lasting consequences. Epidemics can be harbingers of significant political changes that go well beyond their ending, raising questions of what then becomes a new “normal” after the threat passes. Many Hungarians have watched with alarm the complete sidelining of parliament and the introduction of government by decree at the end of March 2020.³² There was no date set for the termination of the emergency measures. The end of the epidemic, and thus the end of the need for the significantly increased power of Prime Minister Viktor Orbán, would be determined by Orbán himself. Likewise, many other states, urging the mobilization of new technologies as a solution to end epidemics, are opening the door to heightened state surveillance of their citizens. The apps and trackers now being designed to follow the movement and exposure of people in order to enable the end of epidemic lockdowns can collect data and establish mechanisms that reach well beyond the original intent. The digital afterlives of these practices raise new and unprecedented questions about when and how epidemics end.³³

Although we want to believe that a single technological breakthrough will end the present crisis, the application of any global health technology is always locally

determined. After its dramatic successes in managing polio epidemics in the late 1950s and early 1960s, the oral poliovirus vaccine became the tool of choice for the Global Polio Eradication Initiative in the 1980s, as it promised an end to “summer fears” globally.³⁴ But as vaccines are technologies of trust, the end of polio continues to be contingent upon maintaining trust in national and international structures through which it is delivered. Wherever that often-fragile trust is fractured or undermined, vaccination rates can drop to a critical level, giving way to vaccine-derived polio, which thrives in partially vaccinated populations.

In Kano, Nigeria, a ban on polio vaccination between 2000 and 2004 resulted in a new national polio epidemic that soon spread to neighboring countries.³⁵ As late as December 2019, polio outbreaks were still reported in fifteen African countries, including Angola and the Democratic Republic of the Congo.³⁶ Nor is it clear that polio can fully be regarded as an epidemic at this point: while polio epidemics are now a thing of the past for Hungary, the rest of Europe, the Americas, Australia, and East Asia as well, the disease itself is still endemic to parts of Africa and South Asia. A disease once universally epidemic is now locally endemic: this, too, is another way that epidemics end.

How do epidemics become endemic? Consider the global threat of HIV/AIDS. From a strictly biological perspective, the AIDS epidemic never ended. HIV/AIDS continues to spread devastation through the world, infecting 1.7 million people and claiming an estimated 770,000 lives in the year 2018 alone.³⁷ But HIV is not generally described these days with the same urgency and fear that accompanied the newly defined AIDS epidemic in the early 1980s. Like coronavirus today, AIDS at that time was a rapidly spreading and unknown emerging threat, splayed across newspaper headlines and magazine covers, claiming the lives of celebrities and ordinary citizens alike. Nearly forty years later, HIV/AIDS has largely become a chronic disease endemic, at least in the Global North. Like diabetes, which itself claimed an estimated 4.9 million lives in 2019, HIV/AIDS became a manageable condition—that is, if one had access to the right medications.³⁸

We have a hard time continuing to attend to the urgency of an epidemic that has now been rolling on for nearly four decades. Even in the first decade of the epidemic, AIDS activists in the United States fought tooth and nail to make their suffering visible in the face of both the Reagan administration’s dogged refusal to talk publicly about the AIDS crisis, and the indifference of the press who went on to cover other topics after the initial sensation of the new plague and the newly discovered virus had become common knowledge.³⁹ In this respect, the social epi-

demic does not necessarily end when biological transmission has ended, or even peaked, but rather when it no longer incites fear as a newsworthy topic compared to other potential headlines of environmental collapse, bioterrorism, a dirty bomb, instability in the Middle East, or another epidemic.

The ending of an epidemic is not much clearer even if there is eventually a successful vaccine in place. Polio has not been newsworthy for a while, even as thousands around the world still live with the disease with ever-decreasing access to care and support. Soon after the immediate threat of outbreaks passed, so did support for the people whose lives were still bound up in the disease. With the polio problem “solved,” specialized hospitals closed, fundraising organizations found new causes, and poster children found themselves in an increasingly challenging world. Few medical professionals are trained today in the treatment of the disease. As intimate knowledge of polio and its treatment withered away with time, people living with polio became embodied repositories of lost knowledge. But people have all but disappeared from how we talk about the disease, despite the fact that hundreds of thousands continue to live with it and a number of people contract it each year as it remains a real threat—it has morphed from its clinical complexity to a virus, which is only ever discussed in the context of vaccines and endings. The social narrative of an epidemic ending, therefore, can impact hundreds of thousands of personal lives, especially those for whom the biological epidemic has not ended.

Our attention is more easily drawn to new diseases as they emerge. Well before AIDS drew the world’s attention to the devastating potential of new epidemic diseases, a series of earlier outbreaks had already signaled the presence of emerging infectious agents. When hundreds of members of the American Legion fell ill with a mysterious new disease after their annual meeting in Philadelphia in 1976, the efforts of epidemiologists from the CDC to explain the spread of this virulent new epidemic disease and its newly discovered causative agent, *Legionella*, occupied front-page headlines.⁴⁰ In the years since, however, as the 1976 incident faded from memory, infections of Legionnaires’ disease have become everyday objects of medical care, even though incidences in the United States have grown ninefold since 2000, tracing a line of exponential growth that looks a lot like COVID-19’s on a longer timescale.⁴¹ Yet few among us regularly pause in our daily lives to consider whether we are living through the slowly ascending limb of a Legionnaires’ epidemic.

Likewise hepatitis C, the most common blood-borne infection in the United States, was also first described in the 1970s, after the rapid spread of a new and

virulent form of hepatitis spreading among patients who tested negative for both hepatitis A and hepatitis B.⁴² Because in hepatitis C, as in HIV, the causative virus can be carried without symptoms for decades, the CDC refers to hepatitis C as a “silent epidemic,” noting a 150% increase in new cases in recent years even in the face of new curative agents, and there are at least 3.5 million cases currently in the United States alone.⁴³ Yet few among us regularly pause in our daily lives to consider we are living through the ascending limb of a hepatitis C epidemic.

Nor do most people living in the Global North stop to consider the ravages of tuberculosis as a pandemic, even though an estimated 10 million new cases of tuberculosis were reported around the globe in 2018 and an estimated 1.5 million people died from the disease.⁴⁴ Tuberculosis, the leading cause of death worldwide from a single infectious agent, is the target of concerted international disease control efforts, and occasionally eradication efforts, but the timescale of this affliction has been spread out so long—and so clearly demarcated in space as a problem of “other places”—that it is no longer part of the epidemic imagination of the Global North.⁴⁵

DNA lineage studies of tuberculosis now show that the spread of the disease in sub-Saharan Africa and Latin America was initiated by European contact and conquest from the 15th century through the 19th century.⁴⁶ In the early decades of the 20th century, tuberculosis epidemics accelerated throughout sub-Saharan Africa, South Asia, and Southeast Asia due to the rapid urbanization and industrialization of European colonies.⁴⁷ Although the wave of decolonization that swept these regions between the 1940s and the 1980s established autonomy and sovereignty for newly postcolonial nations, this movement did not send tuberculosis back to Europe.

Like infectious agents on an agar plate, epidemics colonize our social lives and force us to learn to live with them, in one way or another, for the foreseeable future. There is no simple return to the way things were in the aftermath of an epidemic: whatever normal is built in the aftermath is a new normal. Just as the postcolonial period for most nations who lived under European empires is characterized by continuing structures established under colonial rule, so too are our post-epidemic futures indelibly inflected by each passing agent. Like “universal precautions” and blood-bank screening after HIV/AIDS,⁴⁸ or mask wearing in Asian societies after SARS, much of what we accept as everyday reality in the future will only be seen as different to those who look backward to find the sub-

tle scars where the new normal was sutured onto the fabric of social life that came before.⁴⁹

The uncertainty of the present does not stop countless modelers, politicians, and pundits from making predictions of what will come after the end of the epidemic. After the end of coronavirus, we are told, we will see the end of neoliberal austerity. After the end of coronavirus, we are told, we will see the folly of not investing in national health programs. After the end of coronavirus, we will divest fully from fossil fuels and embrace a green economy, we will see the consolidation of autocracy, we will see barbarism with a human face.

History does not predict what we will see when we see the end of the present epidemic. Like the world of scientific facts after the end of a critical experiment, the world that we find after the end of an epidemic crisis looks in many ways like the world that came before, but with new social truths established.⁵⁰ How these truths are established depends a great deal on current interactions among people, the instruments of social policy as well as medical and public health intervention with which we apply our efforts, and the underlying response of the material which we applied that apparatus against (in this case, the coronavirus strain SARS-CoV-2). While we cannot know now how the present epidemic will end, we can be confident that it in its wake it will leave different conceptions of normal in realms biological and social, national and international, economic and political.

Though we like to think that science itself, like a vaccine, can be a universal remedy to the pandemic, science is contingent upon local practices that are easily thrown over in an emergency and established conventions that do not always hold up in situations of urgency. Today, we see civic leaders claiming the availability of treatments, antibody screens, and vaccines well in advance of any scientific evidence,⁵¹ while relatively straightforward attempts to estimate the true number of people affected by the disease spark firestorms over the credibility of medical knowledge.⁵² Arduous work is often required to achieve scientific consensus, and when stakes are high, heterogeneous data give way to highly variable interpretations. As data move too quickly in some domains and too slowly in others, and urgent time pressures are placed on all investigations, the projected curve of the epidemic is transformed into an elaborate guessing game in which different states rely on different kinds of scientific claims to sketch out wildly different timetables for ending social restrictions.⁵³

These varied endings of the epidemic across local and national settings will only be valid insofar as they are acknowledged as such by others—especially if any

reopening of trade and travel is to be achieved. In this sense, the process of establishing a new normal will continue to be bound up in international consensus. What the new normal in global health governance will look like, however, is more uncertain than ever. Long accustomed to the role of international whipping boy, the WHO Secretariat seems doomed to either be accused of overreaching beyond its mandate, or not acting fast enough. Moreover, it can easily become a target of scapegoating, as the secessionist posturing of Donald Trump demonstrates. Yet the American president's move is neither unprecedented nor unsurmountable. Although Trump's voting base might not wish to be grouped together with the other global power that seceded from the World Health Organization, after the Soviet Union's 1949 departure from the WHO it ultimately brought the Eastern Bloc back to task of international health leadership in 1956. Much as the return of the Soviets to the WHO resulted in the global eradication of smallpox—the only human disease so far to have been intentionally eradicated—it is possible that some future return of the United States to the project of global health governance might also result in a more hopeful post-pandemic future.⁵⁴

As the historian of medicine and historian of time Anne Kveim Lie and Helge Jordheim have recently noted, in epidemic times “the present moves faster, the past seems further removed, and the future seems completely unpredictable.”⁵⁵ How, then, are we to know when epidemics end? How does the act of looking back aid us in determining a way forward? Historians make poor futurologists, but we spend a lot of time thinking about time. And epidemics produce their own kinds of time, in both biological and social domains. Epidemics disrupt the social conventions with which we divide up a given week or day. They carry within them their own tempos and rhythms: the slow initial growth, the explosive upward limb of the outbreak, and the slowing of transmission that marks the peak, plateau, and the downward limb. This last part, the end of an epidemic, is perhaps always ever an asymptote, never disappearing but rather fading to the point where its signal is lost in the noise of the new normal, and even allowed, in some imaginable future, to be forgotten.

NOTES

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