

cians or patients who require just-in-time training or assistance during their first call.

The main barriers to maintaining usual care by telemedicine require changes that are unlikely to come from the federal level. Commercial reimbursement, Medicaid reimbursement, and credentialing are the states' domain. Only 20% of states require

 **An audio interview with Dr. Hollander is available at NEJM.org**

payment parity between telemedicine and in-person services.⁵ Fortunately,

both the Centers for Medicare and Medicaid Services and some local commercial payers have modified payment policy in response to Covid-19. We hope others will follow suit.

Disasters and pandemics pose

unique challenges to health care delivery. Though telehealth will not solve them all, it's well suited for scenarios in which infrastructure remains intact and clinicians are available to see patients. Payment and regulatory structures, state licensing, credentialing across hospitals, and program implementation all take time to work through, but health systems that have already invested in telemedicine are well positioned to ensure that patients with Covid-19 receive the care they need. In this instance, it may be a virtually perfect solution.

Disclosure forms provided by the authors are available at NEJM.org.

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History in a Crisis — Lessons for Covid-19

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Writing in the heady days of new antibiotics and immunizations, esteemed microbiologists Macfarlane Burnet and David White predicted in 1972 that “the most likely forecast about the future of infectious diseases is that it will be very dull.”¹ They acknowledged that there was always a risk of “some wholly unexpected emergence of a new and dangerous infectious disease, but nothing of the sort has marked the last fifty years.” Epidemics, it seemed, were of interest only to historians.

Times have changed. From herpes and legionnaires' disease in the 1970s, to AIDS, Ebola, the severe acute respiratory syndrome (SARS), and now Covid-19, contagious diseases continue to threaten and disrupt human populations. Historians, who never lost

interest in epidemics, have much to offer.

When asked to explain past events, historians are quick to assert the importance of context. If you want to understand how or why something happened, you must attend to local circumstances. But there is something about epidemics that has elicited an opposite reaction from historians: a desire to identify universal truths about how societies respond to contagious disease.

Charles Rosenberg, for instance, found inspiration in Albert Camus's *La Peste* and crafted an account of the archetypal structure of an outbreak.² Epidemics unfold as social dramas in three acts, according to Rosenberg. The earliest signs are subtle. Whether influenced by a desire for self-reassurance or a need to protect

economic interests, citizens ignore clues that something is awry until the acceleration of illness and deaths forces reluctant acknowledgment.

Recognition launches the second act, in which people demand and offer explanations, both mechanistic and moral. Explanations, in turn, generate public responses. These can make the third act as dramatic and disruptive as the disease itself.

Epidemics eventually resolve, whether succumbing to societal action or having exhausted the supply of susceptible victims. As Rosenberg put it, “Epidemics start at a moment in time, proceed on a stage limited in space and duration, follow a plot line of increasing revelatory tension, move to a crisis of individual and collective character, then drift to-

ward closure.” This drama is now playing out with Covid-19, first in China and then in many countries worldwide.

But historians have not limited themselves to description. Rosenberg argued that epidemics put pressure on the societies they strike. This strain makes visible latent structures that might not otherwise be evident. As a result, epidemics provide a sampling device for social analysis. They reveal what really matters to a population and whom they truly value.

One dramatic aspect of epidemic response is the desire to assign responsibility. From Jews in medieval Europe to meat mongers in Chinese markets, someone is always blamed. This discourse of blame exploits existing social divisions of religion, race, ethnicity, class, or gender identity. Governments then respond by deploying their authority, with quarantine or compulsory vaccination, for instance. This step gen-

erally involves people with power and privilege imposing interventions on people without power or privilege, a dynamic that fuels social conflict.

Another recurring theme in historical analyses of epidemics is that medical and public health interventions often fail to live up to their promise. The technology needed to eradicate smallpox — vaccination — was described in 1798, but it took nearly 180 years to achieve success. In 1900, health officials in San Francisco strung a rope around Chinatown in an attempt to contain an outbreak of bubonic plague; only white people (and presumably rats) were allowed to enter or leave the neighborhood. This intervention did not have the desired effect.

Syphilis, one of the great

scourges of the early 20th century, could have been ended, in theory, had everyone adhered to a strict regimen of abstinence or monogamy. But as one U.S. Army medical officer complained in 1943, “The sex act cannot be made unpopular.”³ When penicillin became available, syphilis could have been eradicated more easily, but some doctors cautioned against its use for fear that it would remove the penalty from promiscuity. The human immunodeficiency virus (HIV) could, in theory, have been contained in the 1980s, but it wasn’t — and though the advent of effective antiretroviral therapy in 1996 dramatically reduced AIDS-related mortality, it did not end it. Striking disparities in AIDS outcomes persist, following familiar lines of race, class, and gender. As historian Allan Brandt famously concluded, “the promise of the magic bullet has never been fulfilled.”³

Given what historians have learned about past epidemics, it’s hard not to be jaded now. This particular coronavirus may be new, but we have seen it all before (see slide show at NEJM.org). A novel pathogen emerged in China? That’s no surprise: China has given rise to many past pandemics. People were slow to recognize the threat? That dynamic is what Camus described so well. Officials tried to suppress early warnings? Of course. Governments have reacted with authoritarian interventions? They often do — though the scale of China’s interventions may be unprecedented. A quarantine fails to contain the pathogen? That has happened more often than not, especially with pathogens like influenza virus and SARS-CoV-2 that render people contagious before they’re symptomatic. This does not mean

that interventions are futile. When influenza struck the United States in 1918, different cities responded in different ways. Some were able to learn from the mistakes of those that had been hit first. Cities that implemented stringent controls, including school closures, bans on public gathering, and other forms of isolation or quarantine, slowed the course of the epidemic and reduced total mortality.⁴ China’s aggressive response may have delayed the global spread of the current outbreak.

Two familiar aspects of the response to epidemics are especially disheartening. First, stigmatization follows closely on the heels of every pathogen. Anti-Chinese hostility has been a recurrent problem, whether with plague in San Francisco in 1900, SARS in 2003, or Covid-19 today. Second, epidemics too often claim the lives of health care providers. Physicians died during plague outbreaks in medieval Europe, during a yellow fever outbreak in Philadelphia in 1793, during the Ebola epidemic in 2014, and in China now. Though such mortality reflects the willingness of health professionals to put themselves at risk to care for others, it can also indict governments that ask clinicians to confront outbreaks without the “staff, stuff, space, and systems” they need to be successful and safe.⁵

Whereas historians excel at documenting the drama of past epidemics, they are less comfortable with prediction. How worried should we be about Covid-19? Some experts warn that half the world’s population will be infected by year’s end, an incidence that could result in more than 100 million deaths. History certainly provides a litany of epidemics, of plague, smallpox, mea-



A slide show is available at [NEJM.org](https://www.nejm.org)

sles, cholera, influenza, Marburg virus disease, and the Middle East respiratory syndrome. But catastrophic epidemics that kill millions have been exceedingly unusual, with just a few occurring over the past millennium. Are we now in one of those rare moments, facing a pathogen with just the right (wrong?) mix of contagiousness and virulence, with societies providing the requisite human–animal contact, urban crowding, global travel, and populations stressed by growing social inequality? Given the historical rarity of catastrophic epidemics, such a perfect storm must be unlikely. But it is, regrettably, a possibility.

History suggests that we are actually at much greater risk of exaggerated fears and misplaced priorities. There are many historical examples of panic about epidemics that never materialized (e.g., H1N1 influenza in 1976, 2006, and 2009). There are countless other examples of societies worrying about a small threat (e.g., the risk of Ebola spreading in the United States in 2014) while ignoring much larger ones hidden in plain sight. SARS-CoV-2 had killed roughly 5000 people by March 12. That is a fraction of influenza's annual toll. While the Covid-19 epidemic has unfolded, China has probably lost 5000 people each day to ischemic heart disease. So why do so many Americans refuse influenza vaccines? Why did China shut down its economy to contain Covid-19 while doing little to curb cigarette use? Societies and their citizens misunderstand the relative importance of the health risks they face. The future course of Covid-19 remains unclear (and I may rue these words by year's



An Emergency Hospital in Brookline, Massachusetts, Where Patients Were Cared for during the 1918 Influenza Epidemic.

A slide show is also available at [NEJM.org](https://www.nejm.org).

end). Nonetheless, citizens and their leaders need to think carefully, weigh risks in context, and pursue policies commensurate with the magnitude of the threat.

Which raises one last question of history and political leadership. A “swine flu” scare struck the United States in 1976 in the midst of a presidential campaign. Gerald Ford reacted aggressively and endorsed mass immunization. When people fell ill or died after receiving the vaccine, and when the feared pandemic never materialized, Ford's plan backfired and may have contributed to his defeat that November. When AIDS struck in 1981, Ronald Reagan ignored the epidemic throughout his entire first term. Yet he won reelection in a landslide. The current administration, thankfully, has not followed Reagan's lead. Will it succeed where Ford went awry? Initial assessments of the U.S. government's response have been mixed. The history of epi-

demics offers considerable advice, but only if people know the history and respond with wisdom.

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