

The 1918 Influenza Pandemic: Lessons Learned and Not—Introduction to the Special Section



See also **Morens and Taubenberger**, p. 1449; **Schwartz**, p. 1455; **Orentlicher**, p. 1459; **Hoppe**, p. 1462; **Greenberger**, p. 1465; and **Jester et al.**, p. 1469.

The lethality of the 2018 seasonal influenza outbreak provides a terrifying hint of the catastrophic potential of a 1918-type influenza pandemic. After 100 years, the 1918 pandemic remains a defining moment for public health in the United States and indeed the world. With unprecedented severity and speed, the H1N1 influenza virus spread across the globe to virtually every part of the Earth, killing at least 50 million people.

It is easy to dismiss the carnage of the pandemic that was commonly called the Spanish flu as resulting from conditions unique to its time and to assume that because of medical advances, a similar pandemic would be significantly less lethal today. Yet, some conditions are even more challenging today than those in 1918. For example, in 1918, the world's population was only about 1.8 billion, and most people lived in rural areas. In the last 100 years, the human population has quadrupled to more than 7.2 billion, and far more people live in densely populated metropolitan areas, creating greater transmission risks in disease outbreaks.

HUBRIS, ISOLATIONISM, AND DISTRUST

Today, three of the leading threats to global public health are attitudinal: hubris, isolationism, and distrust. As to hubris, it is true that we live in the age of genomics, vaccines, antibiotics, mechanical ventilators, and other features of high-technology medicine that were unavailable in 1918. Nevertheless, our technology remains woefully ineffective in preventing influenza. Moreover, many people have limited or no access to the medical advances that we do have. In many parts of the world, hundreds of millions of people live in rampant poverty, do not have modern sanitation, endure a lack of health care infrastructure, face cultural barriers to public health interventions, and live in societies without social structures capable of responding to a public health emergency. These conditions support the rapid spread of infectious diseases.

As to the second threat, isolationism, some world leaders erroneously believe that they can seal off their nation's borders after a public health threat emerges and thus escape the ravages of

epidemics in other parts of the world. Public health experts universally reject this naive approach. More than ever, a public health event in any part of the world can create a public health threat everywhere. Airplane travel facilitates the rapid spread of pathogens, and even faster communication technology enables the spread of fear and misinformation. Without public health capacity building and disaster preparedness around the globe, each novel disease outbreak means “reinventing” public health policy. Often this requires balancing protecting public health with respecting civil liberties.

A third problem is distrust. In our era of political polarization, “fake news,” and tribal politics, trust in the media, government officials, and even science is fading. This can be catastrophic if an influenza or another type of pandemic arises. Under such circumstances, the public's failure to trust the guidance offered by public health officials may well make a bad situation worse.

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CONTINUING CHALLENGES

This special section of *AJPH* (pp. 1449–1472) contains a series of articles anchored in the 1918 influenza pandemic but explored in the light of continuing and contemporary challenges. The special section begins with an overview of the 1918 pandemic and our capacity to respond to future pandemics by Daniel Jernigan, director of the Influenza Division at the Centers for Disease Control and Prevention, and his colleagues. After examining the epidemiology of the 1918 epidemic and the reasons that it was so lethal, Jester et al. (p. 1469) discuss the advances that have been made in the last 100 years in diagnostics, vaccines, antiviral medications, hospital infrastructure, and preparedness. Their review offers some reason for comfort—but only some. As they explain, the combination of population growth, increased connectivity, and the expanding number of swine and poultry populations has left us vulnerable to influenza pandemics. Moreover, significant gaps remain in terms of surveillance, vaccine production and distribution, therapeutics, and clinical capacity.

In their article, David Morens and Jeffrey Taubenberger (p. 1449), both from the National Institute of Allergy and Infectious Diseases at the National Institutes of

Health, recount what is known about the H1N1 virus that caused the 1918 pandemic. They also stress that “virtually all 1918 influenza deaths were due not to influenza itself but to complicating secondary bacterial pneumonias,”^(p1453) which often arose with great rapidity. This points to the need to “identify early biomarkers for impending bacterial pneumonia in influenza patients”^(p1453) to enable rapid treatment. They also stress the importance of developing vaccines that provide broader protection. Although we may not be able to prevent the next pandemic, we should work to mitigate its effect.

In his contribution, Jason L. Schwartz (p. 1455) from the Yale School of Public Health examines the respective role of vaccines and nonpharmaceutical interventions in 1918 and today. As Schwartz explains, during the 1918 pandemic, many communities implemented a range of social distancing measures. Although these measures were long thought to be ineffective, recent research suggests that they may have had some positive effect. Conversely, the vaccines that were used were clearly ineffective. Since 1918, however, virology has advanced dramatically, and vaccines have improved, but much research is needed to develop a better influenza vaccine. Still, as in 1918, we will remain dependent on a mix of biomedical interventions and social

distancing measures when the next pandemic strikes.

PANIC, XENOPHOBIA, AND FEAR

The continued and at times problematic role of non-pharmaceutical interventions is a point that Michael Greenberger (p. 1465), from the University of Maryland School of Law, develops in his article. After discussing why we remain vulnerable to a major pandemic, Greenberger focuses on the limitations of non-pharmaceutical interventions, especially quarantine, looking in particular at how it was misapplied during the 2014 Ebola outbreak. As Greenberger explains, “our approach to pandemics still follows a cycle of ‘panic-neglect-panic-neglect,’”^(p1467) in which we fail to prepare adequately and then respond to an outbreak with ineffective and needlessly draconian measures.

The theme of inappropriate responses spurred by panic is picked up by Trevor Hoppe (p. 1462) from the State University of New York at Albany. Hoppe treats the nomenclature given to the 1918 pandemic—the Spanish flu—as a window into the significant role that xenophobia, stigmatization, and the scapegoating

of vulnerable populations play in pandemic response. As Hoppe explains, giving a disease the name of a foreign or minority community is closely related to the desire to wall off those who are viewed as threats of contagion. This leads to an excessive reliance on counterproductive measures, including travel bans that attempt to prevent the introduction of an emerging disease into a nation. As Hoppe argues, even though the debate continues in the literature, the evidence as a whole suggests that air travel plays a less important role in the spread of pandemics than is commonly believed. Xenophobia, rather than science, helps to explain the call for travel bans.

The fear that can accompany a pandemic affects more than public health responses. It also affects how physicians and other health care workers respond during an emergency. In his Commentary, David Orentlicher (p. 1459) of the University of Nevada, Las Vegas, analyzes the ethical obligations of physicians to treat patients during an epidemic both in 1918 and today. Orentlicher explains that in 1918, the ethical obligations of physicians were relatively clear: they had a duty to treat, even in the midst of an epidemic. Since then, the American Medical Association has diminished physicians’ duty to

treat, even as the risk to physicians has declined. Orentlicher argues for a more robust duty in recognition of physicians’ role and the social contract between physicians and the public.

LESSONS LEARNED AND NOT

Taken together, these commentaries offer a sobering reminder of the dangers of pandemics and the inadequacies of our planning and response. Although many advances have been made since 1918, the authors in this special section show us that the threat of emerging infectious diseases remains, as does the danger of both panic and neglect. We hope that stressing the lessons we have learned and those that we are still attempting to learn can help us avoid that cycle, so that the horrors of 1918 will never be repeated. **AJPH**

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Both authors contributed equally to this editorial.

Tractor Rollovers Are Preventable

 See also Myers et al., p. 1517.

The agriculture sector continues to have the highest rate of fatal occupational injuries (23.2 per 100 000 full-time-equivalent workers, with 593 fatalities in 2016) and the highest rate of nonfatal work-related illnesses and injuries (6.1 per 100 full-

time-equivalent workers, with 58 300 cases in 2016).¹ Tractor deaths are responsible for approximately one third of these fatalities, with about half caused by tractor rollovers. Tractor rollovers occur for a number of reasons, including tractor

operations near irregular, slippery, and sloped terrain; fixed pathway obstacles; and operator issues such as distraction, excessive speed, improper hitching, and failure to set the break when stopped (<https://www.osha.gov/laws-regs/regulations/standardnumber/1928/1928.51>).

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