

Medical News & Perspectives

Twentieth-Century Lessons for a Modern Coronavirus Pandemic

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As the United States contemplated reopening in mid-April, the country could have taken a lesson from history: once social distancing is in place during a pandemic, stay the course.

That lesson was outlined in a 2007 pandemic preparedness [study](#) from researchers at the University of Michigan's Center for the History of Medicine who teamed up with colleagues at the US Centers for Disease Control and Prevention. Their goal: to understand how social distancing and quarantine efforts during the devastating 1918-1919 influenza pandemic affected death rates in US cities.

Data from 43 large US cities spanning September 8, 1918, through February 22, 1919, showed that nonpharmaceutical interventions—a traditional term for social distancing practices like closing schools and banning large public gatherings—could prevent influenza deaths. In the study, the pandemic took a lesser toll on cities that implemented these interventions earlier and for longer periods.

Even so, the citizenry can become restless, the study's lead author, Howard Markel, MD, PhD, explained during a recent interview with *JAMA*. It happened in Mexico, where social distancing was in effect during the 2009 influenza A(H1N1) pandemic, he noted.

When those practices were relaxed, cases went back up. "That second hump was never as high as the first hump, but they went up, nevertheless, and then, they pulled back again, and the cases went down," said Markel, director of the Center for the History of Medicine.

The following is an edited version of *JAMA*'s interview with the noted medical historian.

JAMA: Can you tell us a little bit about what happened in 1918?

DR MARKEL: It was probably the worst contagious crisis in the history of humankind. Around the world, anywhere from 40 to 100 million people died. In America, there were 10 to 14 million cases and at

least 500 000 to 750 000 people died. It was a particularly virulent and novel strain of influenza. A lot of young adults were struck down. It's also important to recall that 1918 was when the United States of America entered World War I. Four to 5 million young men were sent to army camps all over the country by train, in not the most sanitary conditions. These young men were not only victims to influenza, but they were also terrific vectors for the virus.

Nobody knew much about virology at all. There was a great deal of knowledge about bacteriology, but no one knew what the etiologic agent of influenza was. In fact, many thought it was the bacterium *Haemophilus influenzae*. And a lot of people who died didn't just die of influenza. They died of secondary bacterial pneumonia. In 1918, there were no antibiotics, let alone antivirals. There were no intravenous fluids and medical care was really kind of warehousing of these young men and women.

JAMA: How does the COVID-19 pandemic compare to the 1918 influenza pandemic?

DR MARKEL: They're both spread by respiratory droplets but SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) is a very different virus and, most

importantly, it's a novel virus. Because it's so new, we're really kind of flying by the seat of our pants. We're finding out things as we go along, and we're finding out more and more and at a faster rate than ever in human history. But we're still trying to unlock the mysteries of COVID-19 (coronavirus disease 2019).

JAMA: Have nonpharmaceutical interventions like social distancing and quarantine evolved since 1918?

DR MARKEL: Quarantine originated back in the 1370s in Venice to combat plague. It literally meant 40 days. That was the amount of time that ships had to stand in the lagoon, and they could not unload their goods or passengers. Ever since then, quarantine has been fine-tuned and changed.

In 1918 they didn't have many tools in their toolbox, and these traditional ones of isolating the ill, quarantining people you suspect had contact with the ill, school closures and public gathering bans, as well as public service announcements, were pretty much all they had. America was a very different country. Not everyone owned a car, let alone had a telephone. There wasn't connectivity. Moms mostly stayed at home, so school closure wasn't nearly as big of a deal as today when 70% of mothers work



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outside of the home. Every city that we looked at in our study did something, but not every city had as good of a result, in terms of morbidity and mortality. So, we wanted to find out why.

JAMA: What did you find?

DR MARKEL: Cities that implemented early, layered, and long-duration interventions had a far better mortality and morbidity rate than those that did not. And that is where the thesis for what has now been called “flattening the curve” emerged.

Our theory was, what if these interventions would flatten that curve and extend it over many more days? That would, perhaps, allow fewer people to get sick and die. It would also create a situation where fewer people were rushing to the hospitals or clinics at the same time and overrunning their capacity. That’s exactly what these cities showed, and that was very exciting to us. Today, unlike in 1918 and ‘19, we hope that modern medicine could use that extra time to develop medical therapies and, even better, a vaccine.

JAMA: One of the present worries is the toll that the current pandemic is taking on our health care infrastructure. In 1918, did they see strains on their health care systems?

DR MARKEL: It’s hard to compare because the health care system is so vastly different, but it did overwhelm their hospital systems. They weren’t nearly equipped. There weren’t as many hospitals. In 1918, most people who were of means wouldn’t be caught dead in a hospital. Those were places for poor people, and many Americans of that era preferred to get sick and be cared for in their homes. But their health systems were overwhelmed. Their doctors and nurses were overwhelmed. Their resources were overwhelmed.

The cities that had the highest morbidity and mortality rates—specifically Pittsburgh, which was the worst in the country, and Philadelphia, which was the second from worst—also had a really disorganized public health effort. They did their measures late. They were struck early in the epidemic. There were lots of petty fights between different levels of government. These internecine battles between politicians, time and again, have a very negative effect on the administration of good pandemic care. This is something I worry about at present because we’re seeing a lot of

squabbles and fighting. I would argue that in times of contagious crisis, politics have to end with the microbe. We have to all work together to come up with the best policies and the best methods to ensure the health of the American people.

JAMA: In 1918, what was the standard personal protective equipment?

DR MARKEL: Face masks were the big thing, and there was a shortage of surgical face masks, which were then made of gauze. There were a lot of American Red Cross chapters, mostly of women who volunteered for the war effort and fashioned face masks out of gauze or linen or whatever material they had. There were articles in the newspaper about some women who wore fashionable face masks made out of chiffon. There were all sorts of stories about this mask or that mask but of course these masks were so porous, so it’s highly doubtful they gave much protection.

JAMA: How did the way information about influenza got out to the public compare with today?

DR MARKEL: The leading source of information would have been the newspaper. There was no radio or television, but newspapers put out 6 or more editions per day. Many cities had, 3, 4, 5 newspapers. But the media covered the flu epidemic as closely as modern newspapers. It was all flu all the time, and you could read good stories and silly stories. There’d be ads for snake oil alongside an important story by the commissioner of health of that city.

What’s different now in our world of social media and the internet is that good stories and bad stories are amplified at a level that’s truly painful to the ears. That’s one issue. The second thing is that information travels at the speed of electrons. And the third problem is that information is no longer just democratized, it’s atomized. So, everyone reads the news source they want or that appeals to them, and there’s a concept that everyone is entitled to their own facts. Well, no, that’s silly. There are scientific facts. Frequently, those facts are revised. Sometimes they’re wrong. But we work to correct them, and you’re not entitled to your own set of facts about infectious diseases and pandemics.

JAMA: There have been disheartening reports of xenophobia during the current pan-

demia. Was there any sense of the same phenomenon in 1918?

DR MARKEL: I spent a lot of my career studying precisely that issue, people who were stigmatized and blamed for contagious crises across history. That is certainly one of the major themes of pandemics past and, sadly, present. But in 1918, unlike all these other epidemics or pandemics that I’ve studied, there wasn’t a lot of xenophobia. We found 2 newspaper clips blaming Italian immigrants. My theory is that influenza spread so widely and so quickly across various levels of the population in America and elsewhere that it was hard to scapegoat anybody. It was hard to blame a particular group, but that’s the exception to the rule.

JAMA: Are there any lasting systemwide changes that you foresee coming out of the current pandemic?

DR MARKEL: Across human history concealment is a very common theme; the Chinese government concealed SARS for a while. These concealments give the microbe a running head start, and in our tiny world, we can no longer afford that. An outbreak anywhere can easily go everywhere, and we have to work together not just at the local, state, and even the federal, but also the international level. There has to be cooperation and surveillance in each country. There has to be open and transparent reporting, and there have to be active and rapid responses when outbreaks are discovered.

The worst thing about the last act of every epidemic or pandemic I’ve ever studied is something I call global amnesia. We tend to forget about it, and the political actors go on to the next issue and don’t do the funding that needs to be done for steady preparedness. I’m sure you have a fire department in your city, and I bet your house never burnt down. But I also bet you’re glad you have a fire department and you pay taxes for that because, in the event that your house does burn down, they’ll help you. I use that metaphor for our public health enterprise, from the local to the international level. When it works at its best, we don’t know about infectious diseases because they don’t break out. But we need to prepare all the time. If COVID-19 teaches us nothing but that, then I think we’ll have a healthier world. ■

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