Coronavirus: Applying Influenza Pandemic Lessons to COVID-19

By Alex Berezow, PhD — May 13, 2020

Dr. Michael Osterholm, ACSH advisor and infectious disease epidemiologist, has co-authored a report on the coronavirus, drawing upon lessons learned from previous influenza pandemics. He and his co-authors predict one of three scenarios for how the COVID-19 pandemic will play out.

The novel coronavirus, SARS-CoV-2, has been the source of never-ending surprises, all of which have been very bad. Predicting how the pandemic will end has been a particular challenge, given that we know so little about the basic biology of the virus, and we have few historical precedents upon which we can rely.

Given this dearth of information, ACSH advisor and infectious disease epidemiologist Dr. Michael Osterholm co-authored a report published by the University of Minnesota’s Center for Infectious Disease Research and Policy (CIDRAP). The report attempts to provide a vision for the future based upon lessons learned from previous influenza pandemics.

It begins by noting that the two previous coronavirus pandemics, SARS and MERS, are not instructive for the current pandemic because the viruses had substantially different epidemiological features. Though SARS-CoV-2 and pandemic influenza do have important differences (e.g.,
incubation time, proportion of asymptomatic carriers, and the prevalence of presymptomatic viral shedding), they share quite a lot in common. They are both (1) novel pathogens that attack an entirely susceptible human population; (2) spread by respiratory droplets and aerosols; (3) spread by asymptomatic carriers; and (4) capable of rapidly circling the globe. Thus, the authors reasoned that influenza pandemics serve as a useful analogy for COVID-19.

Since the early 1700's, there have been at least eight influenza pandemics, four of which occurred since the turn of the 20th Century. The authors highlighted the following major lessons about them:

1. There is no seasonal pattern. A pandemic could start in winter, spring, summer, or autumn.
2. Seven of the pandemics had a first wave followed by a larger second wave about six months later. Some pandemics had smaller subsequent waves for two years.
3. With the exception of the 2009-10 pandemic, vaccination campaigns had little effect. (Of course, an influenza vaccine [3] didn't exist until the 1940s.)
4. In three of the four pandemics since 1900, the pandemic strain became more human-adapted and replaced or co-circulated with the seasonal strain.
5. Pandemics last about 18-24 months because it takes a while for herd immunity to develop.
Possible Pandemic Wave Scenarios for COVID-19

**Scenario 1:** Peaks and Valleys

**Scenario 2:** Fall Peak

**Scenario 3:** Slow Burn
Using these lessons, the authors predict that COVID-19 will follow one of three scenarios. (The scenario descriptions are taken verbatim from the report.)

**Scenario #1.** "The first wave of COVID-19 in spring 2020 is followed by a series of repetitive smaller waves that occur through the summer and then consistently over a 1- to 2-year period, gradually diminishing sometime in 2021."

**Scenario #2.** "The first wave of COVID-19 in spring 2020 is followed by a larger wave in the fall or winter of 2020 and one or more smaller subsequent waves in 2021."

**Scenario #3.** "The first wave of COVID-19 in spring 2020 is followed by a “slow burn” of ongoing transmission and case occurrence, but without a clear wave pattern."

Regardless of which scenario plays out, the authors believe that COVID-19 will become a circulating seasonal virus that is considerably less lethal.

**One More Thing**

Unwittingly perhaps, the authors made an extremely important observation at the very beginning of their report:

> "When severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2)—the virus that causes COVID-19—first emerged in Wuhan, China, in December 2019, even the most experienced international public health experts did not anticipate that it would rapidly spread to create the worst global public health crisis in over 100 years. By January 2020, a few public health officials began sounding the alarm, but it wasn’t until March 11, 2020, that the World Health Organization declared a global pandemic."

In the coming months and years, those with political agendas will use COVID-19 to criticize the politicians they love to hate. But remember that the novel coronavirus caught us all off guard. The biomedical community was always worried about influenza, not coronavirus, which is why most of us (myself included) were dead wrong about the danger posed by SARS-CoV-2. Anyone who says otherwise, namely that they "knew" this pandemic was coming, is engaging in revisionist history.
