

Pandemic Influenza

How Worried Should We Be?

Joshua D. Jones

For most people, the destruction and upheaval caused by the 1918-19 flu pandemic is an obscure historical event, but the 2003 SARS epidemic and the smoldering H5N1 avian influenza epizootic in Asia have renewed interest in a flu pandemic and brought dire predictions of its imminent recurrence.

In the fall and winter of 1918-19, a novel H1N1 strain of influenza virus spread so rapidly and with such virulence that it killed between 20 and 50 million people. Up to 20 percent of the world's population was infected, and an estimated 675,000 people died of influenza in the US alone. Unlike a typical flu year when most deaths occur in infants and the elderly, this pandemic disproportionately affected the young and healthy. Current theories attribute the high mortality to the lack of population immunity to the strain as well as the vigorous immune response produced by the virus in the respiratory tract, resulting in rapid development of acute respiratory distress syndrome (ARDS), highly lethal in this era before mechanical ventilation.

The large percentage of the population affected in each country overwhelmed the capacity of health care systems as well as the ability to safely dispose of the large number of dead. In the US, the war propaganda effort and official denial of the problem in many areas prevented a rapid response to the epidemic. Eventually widespread, and widely unpopular, authoritarian measures were implemented, including banning public gatherings, closing schools, and limiting funerals to 15 minutes.

Why worry?

Pandemic influenza is caused by a strain of influenza A virus that is new to humans and to which, therefore, there is almost no pre-existing population immunity. The strain must also possess the ability to produce sustained human-to-human transmissions.

Much of the concern about a looming pandemic arises from the steady increase in epizootic activity with avian influenza strains in the past few years and the accompanying increase in human infections. The first dramatic H5N1 epizootic, in 1997 in Hong Kong, resulted in 18 human cases with six deaths and was only interrupted through the culling of millions of chickens. The H5N1 epizootic recurred in 2003 in eight Asian countries and was again slowed by mass culling, but it has recurred in those countries. As of August 2005, 109 human H5N1 infections have been confirmed, with 55 deaths (50 percent mortality).

It is impossible to predict all of the features of the next pandemic, but some features can be anticipated. As with all recorded flu pandemics, it is likely that the disease will come in waves, with the contagiousness and severity of illness varying over time. In the best case scenario, this

may also allow enough advanced warning to put resources in place and possibly develop an effective vaccine that will reduce the extent of the pandemic. It is nearly certain that in the early phases, existing flu vaccines will not be effective, since the strain is likely to be too different from the currently circulating strains that comprise the yearly vaccine.

Will our response be effective?

As in 1918, we can expect that the capacity of the health care system will be overwhelmed. US hospitals do not have nearly the beds and ventilators to care for the number of people with respiratory failure that would accompany a repeat of the 1918 event. Mathematical models using current population figures have estimated the number of US deaths could range from 88,000 to 227,000.

Current US preparedness also has some critical shortcomings. The timely availability of an effective vaccine, for example, cannot be guaranteed, given the reliance on a labor- and resource-intensive, egg-based viral culture method. In addition, the current supply of neuraminidase-inhibitors is inadequate to protect even a small percentage of the population and would likely need to be limited to the public safety and health care sectors.

Another area of concern is the role of isolation (of cases) and quarantine (of contacts) during a pandemic. Other than during the SARS epidemic, where these techniques were used with varying success, there is little precedent in recent decades for the US political system supporting public health in implementing these politically unpopular measures.

Given the history of influenza, it is certain that there will be a pandemic. Whether it will have the plague-like severity of 1918-19, with the accompanying social upheaval, is impossible to predict. In the US we were spared much of the disruption caused by SARS, but countries with large numbers of SARS cases experienced a taste of the chaos that will likely accompany a severe influenza pandemic. Fortunately the possibility of a pandemic is being taken seriously on an official level. But it remains to be seen if we are willing to expend the resources necessary to even start to prepare for a true influenza pandemic. ■

This article is an excerpt of a longer article, which you can read online at www.nwcp.org/NPH/nph_f2005.html.

Author

Joshua D. Jones, MD, is the physician epidemiologist for the Portland Area Office, Indian Health Service.

The views expressed by the author may not represent the official position of the Indian Health Service or the US Department of Health and Human Services.