The Coming Flu Pandemic

By David J. Gibson, MD

MOST PEOPLE ALIVE TODAY HAVE no frame of reference for an influenza pandemic. The flu epidemics of 1957 and 1968 were relatively mild. The concern now is a pandemic of magnitude similar to the one that spread worldwide in 1918 and 1919 - the "Spanish flu." It killed about 50 million people.

Most of humanity felt its effects. The flu followed the path of its human carriers, along trade routes and shipping lines. Outbreaks swept through North America, Europe, Asia, Africa, Brazil and the South Pacific. With one-quarter of the US and one-fifth of the world infected, it was impossible to escape the illness. Even President Woodrow Wilson suffered from the flu in early 1919 while negotiating the crucial Treaty of Versailles to end World War I.

Bodies piled up. Besides the lack of health care workers and medical supplies, there was a shortage of coffins, morticians and gravediggers. Conditions were not so far removed from the Black Death, the bubonic plague of the Middle Ages.

The World Health Organization warns the coming influenza pandemic will threaten the health of nearly everyone on earth. A fifth to a third of the entire world's population will likely be infected. It will be the world's largest ever public health infectious-disease emergency.

The A/H5N1 avian flu virus

The A/H5N1 avian flu virus first crossed into human beings in 1997, but has been mutating in recent years in ways that make it more capable of moving from birds to people. The spate of human infections in mid-2003 in China and Southeast Asia was so serious that over 100 million domestic birds were killed or died before infections subsided in early 2004. Bird-to-human transmission began again last June.

The virus has now appeared in wild migratory birds whose flyways spread around the globe. Migratory birds that congregate at the influenza A/H5N1 virus epicenter, Qinghai Lake in China, migrate to Europe. These migratory patterns are a vector for the A/H5N1 avian flu virus to spread well beyond its original reservoir.

The danger is that a strain of bird influenza virus will swap genes with a strain highly infectious between humans. If people with the human flu should catch the avian type (through direct contact with infected poultry), a gene swap could easily occur - and direct human-to-human transmission becomes possible. Current patterns of international travel mean we may be only weeks away from a global pandemic.

A recent bird to human outbreak has so far killed 53 people in Vietnam, Thailand and Cambodia; even more ominously, the first probable case of human to human transmission was recorded last September in Vietnam. Avian flu viruses swapping genes with human types caused the "Asian flu" outbreak in 1957-58 (which killed 70,000 people in the United States alone) and the "Hong Kong flu" pandemic in 1968-69 (50,000 US deaths).

The A/H5N1 virus is resistant to most anti-viral drugs, and the avian form has been getting steadily deadlier. Early outbreaks killed around 10 percent of poultry flocks; recent infections have killed up to 90 percent.

For people who caught avian flu, the death rate has been horrendous: 50 to 75 percent. A gene-swapped version directly communicable between human beings might be less lethal, but could still far exceed the 1-2 percent fatality rate of the Spanish influenza.

Unlike the severe acute respiratory syndrome (SARS) virus that killed 774 people two years ago, the avian flu may be very hard to stop before spreading into the general population. People transmitting the SARS virus already had symptoms, so this disease could be picked up at ports of entry with temperature detectors.

With avian flu and its very long incubation period, an individual can be infectious without any symptoms. If human infections spread, there could be not only huge loss of life, but also global economic chaos.

The "Spanish influenza" outbreak

The influenza pandemic of 1918-19 killed an estimated 550,000 Americans. Globally, it claimed 30 million lives. This catastrophe ranks as the 20th century's most readily forgotten global disaster, and almost certainly the deadliest pandemic in recorded history. Even today, its virulence remains an utter mystery. Scientists speculate that it was the result of a dramatic genetic "shift" in the influenza virus.

Mortality was high in all age groups, but highest in people 20 to 40-years-old, exactly the population that usually would be the hardiest. Records indicate people were struck with illness on the street and died rapidly. One anecdote was of four women playing bridge together late into the night; overnight, three of the women died from influenza. Others told stories of people on their way to work suddenly developing the flu and dying within hours. One physician wrote that patients with seemingly ordinary influenza would rapidly "develop the most viscous type of pneumonia that has ever been seen" and later when cyanosis appeared in the patients, "it is simply a struggle for air until they suffocate." Another physician bore witness to the fact that the influenza patients "died struggling to clear their airways of a blood-tinged froth that sometimes gushed from their nose and mouth." Physicians were helpless against this powerful influenza agent.

Influenza pandemics have a 30 or 40-year cycle of recurrence. The 1918 strain traveled faster and was more dangerous than its known predecessors. It arrived in Europe on American troop ships in early April 1918, and by July had spread as far east as Poland.

It is believed the virus causing the 1918 pandemic, or a close descendant, is now "archived" in pigs, one of the many non-human reservoirs of influenza, and one where a virus changes much more slowly than it does in man.

In 1976, an outbreak of influenza at Fort Dix, N.J., killed a healthy soldier. Laboratory studies showed his virus to be similar to one in pigs, and virologists feared the deadly 1918 strain had reentered the human population. This led to the controversial "swine flu" vaccine. As it happened, the Fort Dix strain never reappeared.

Predictable Results

There are two readily predictable scenarios should a pandemic spread.

- **The health care infrastructure will be overwhelmed.** All the high-tech, interventional, mostly hospital-based health care systems into which we pour most of our financial resources will be of little or no value.

In the 1918-19 pandemic, medical practitioners were overwhelmed. Medical students were pressed into service to care for the sick. Third and fourth year classes were closed and students assigned jobs as interns or nurses. One article at the time noted that

"depletion has been carried to such an extent that the practitioners are brought very near the breaking point." The shortage was compounded by the deaths of physicians in the pandemic.

The Red Cross recruited lay volunteers to fight the pandemic. In some areas of the US, the nursing shortage was so acute that the Red Cross asked local businesses to allow workers the day off if they volunteered in the hospitals at night.

Emergency hospitals, often tent structures, were erected to take in the patients from the US and those arriving sick from overseas.

Should history repeat, public buildings will become temporary hospitals. The "hospital" will return to its medieval paradigm, a warehouse for those dying from infectious disease.

- **Civil rights will be suspended.** People will have little choice but to accept restrictive governmental measures should the events of 1919 repeat themselves.

At the time, it was felt any gathering of people, with the mixing of bodies and sharing of breath in crowded rooms, was dangerous. Gauze masks were distributed for wearing in public; stores could not hold sales; saloons, dance halls, and cinemas were closed; and public funerals were prohibited. Churches remained open, but only the minimum services could be conducted. Street cars were thought to be a special menace to society with their poor ventilation, crowding and uncleanliness. Many public institutions such as public schools were closed.

Some towns required a signed certificate to enter and railroads would not accept passengers without them. Those ignoring the flu ordinances had to pay steep fines enforced by extra officers.

Both the Illinois and New York State Health Departments ordered patients be quarantined until all clinical manifestations of the illness subsided. They held that the danger of the influenza pandemic was so grave that it was imperative to secure isolation for the patient.

(This year, President George W. Bush added to the list of diseases for which a quarantine can be declared "influenza caused by novel or re-emergent influenza viruses that are causing, or have the potential to cause, a pandemic.")

An avian flu pandemic will trigger the closing of our borders and the quarantine of entire cities that are ports of entry for international travelers. However, even these measures might not slow the pandemic.

Can anything prevent this disaster?

Any definitive prevention must address transmission of the virus in poultry, specifically free-range chickens and wetland-dwelling ducks. In other words, a couple of hundred million Asian peasants have to be persuaded to stop sharing living space with their poultry.

The world community would have to invest hundreds of billions of dollars and a substantial amount of political capital to bring about that change. Clearly, it will not happen.

The drug oseltamivir (Tamiflu), manufactured by Roche, may be of some benefit. Taken prophylactically for five days, it has been shown to prevent infection in some people exposed to influenza virus. There is enough oseltamivir in our government's "strategic national stockpile" of pandemic and bioterrorism drugs to treat about 1 million people. We need 100 times that amount.

No vaccine protects against the influenza A/H5N1 avian flu virus (although one may be

on the horizon). As things stand, none could be available for months after a pandemic begins. That is why five teams of scientists, writing in the journal Nature, urged a permanent global task force to react quickly to outbreaks of bird flu. Otherwise, they warned, millions will die.

It takes six months to grow large amounts of flu vaccine in fertilized chicken eggs - much too long to stop a rapidly moving virus.

The United States is the only country to order production of vaccine against bird flu - a move that even on a small scale is an expensive gamble. The Department of Health and Human Services has contracted with two companies to make about 2 million doses of vaccine against the currently circulating influenza A/H5N1 strain, but they might not be usable when the pandemic actually hits. The urgent task is to develop a way of mass-producing influenza vaccine far faster than now possible.

The bottom line is that mankind is in essence defenseless should this influenza menace mutate and spread among humans.

Physicians in Sacramento have seen medical catastrophes before. During the great Sacramento cholera pandemic of 1850, the population fled the city but all of the city's physicians stayed and cared for the sick.

It is estimated that 800-1,000 people, roughly 10-15 percent of the city's population, died in Sacramento within 18 days. Seventeen physicians, an unusually high toll, were also its victims.

I have no doubt that should a crisis arise, Sacramento physicians will rise to the challenge once again.

djgibson@winfirst.com

Sierra Sacramento Valley Medical Society
5380 Elvas Avenue #100 • Sacramento, CA 95819
916.452.2671 PH • 916.452.2690 FX • Email: info@ssvms.org