

Swine Flu Outbreaks Mobilize International Public Health Effort (2009)

By Cheryl Pellerin
Science Writer

Washington — Outbreaks of a new strain of influenza virus that began in north-central Mexico March 22 and have spread to the United States, Canada and Spain so far have prompted the World Health Organization (WHO) to declare the event a public health emergency of international concern.

Mexican authorities have reported up to 1,600 influenza cases and more than 100 influenza deaths. Twenty six of the deaths have been confirmed as caused by the new H1N1 swine flu virus, WHO spokesman Gregory Hartl said in an April 27 briefing.

The number of U.S. cases has risen to 40, and on April 26 the United States declared a public health emergency, which “allows us to free up federal, state and local agencies and their resources for prevention and mitigation,” Secretary of Homeland Security Janet Napolitano said. Flu cases in the United States so far have been mild.

“We do not yet have a complete picture of the epidemiology or the risks,” WHO Director-General Dr. Margaret Chan said at an April 25 briefing, including possible spread beyond the currently affected areas. In the assessment of WHO, this is a serious situation that must be watched very closely.

Scientists and experts from the U.S. Centers for Disease Control and Prevention (CDC), WHO and its Global Outbreak Alert and Response Network — a collaboration of institutions and networks that pool human and technical resources to rapidly identify and respond to international outbreaks — have traveled to Mexico to help answer many questions that remain about the new H1N1 variant, which contains bird and swine viruses from North America, a swine flu strain found in Asia and a human flu strain, Nancy Cox, head of CDC’s Influenza Division, said during an April 26 briefing.

“Influenza viruses are notoriously unpredictable and full of surprises, as we are seeing right now,” Chan said.

“The viruses causing cases in some parts of Mexico and the United States are genetically the same,” she added. “This is an animal strain of the H1N1 virus and it has pandemic potential because it is infecting people. However, we cannot say, on the basis of currently available laboratory, epidemiological and clinical evidence, whether or not it will indeed cause a pandemic.”

FLU VIRUS ABCs

There are three kinds of flu viruses: A, B and C. Influenza viruses can infect people, birds, pigs, horses, seals, whales and other animals, but wild birds are their natural hosts. A-type viruses mutate much faster than B and C types, so they are divided into subtypes based on two proteins on the virus surface: hemagglutinin (HA) and neuraminidase (NA).

There are 16 HA subtypes and nine NA subtypes, and subtypes are named according to the numbers of their HA and NA surface proteins. The letters H and N in subtype names like H1N1 or H5N1 refer to these proteins.

The new H1N1 variant that arose in Mexico is being called a swine flu, but experts do not yet know how the disease was transmitted to people.

“H1N1 is being called ‘swine flu’ because of the outbreak of a different 1918-origin virus that caused significant mortality in swine and human populations and was known as the Spanish flu,” said Dr. Peter Cowan, associate professor of epidemiology and public health at the College of Veterinary Medicine at North Carolina State University. “The [1918 H1N1] virus probably has a wild bird origin but its definitive origin remains unknown.”

The Spanish flu killed up to 50 million people worldwide, nearly half of them young, healthy adults. H1N1 viruses still circulate today after being re-introduced into the human population in the 1970s.

Cowan is a moderator for ProMED-mail, a global electronic reporting system for outbreaks of emerging infectious diseases and toxins that is a program of the International Society for Infectious Diseases.

NEXT STEPS

WHO declared the outbreak a public health emergency of international concern based on the International Health Regulations, which were revised in 2005 and went into effect in June 2007. (See “Updated Rules Offer New Framework for Health Security .”)

Many of the tracking systems and processes that allow WHO to rapidly issue infectious disease alerts and proactively respond to disease outbreaks that could affect other countries are a result of these regulations, whose revisions updated the 1969 regulations. The 1969 regulations asked countries voluntarily to report only cholera, plague and yellow fever.

Under the 1969 version, if countries reported the diseases at all, WHO published the information once a week in an epidemiological record. Measures for dealing with the diseases were outlined in the regulations, and only member countries were allowed to report disease outbreaks.

In 2007, the regulations went from a set of guidelines that asked nations to report three diseases to a reporting of all public health events. The revised regulations include smallpox, polio, SARS and new strains of human influenza, whose occurrences member states must report immediately to WHO.

Still to be determined is whether a vaccine will be produced for the H1N1 variant, although WHO and CDC are proceeding as though such a decision might be made.

“Whenever we see a novel strain of influenza, we begin our work in the event that a vaccine needs to be manufactured,” CDC Acting Director Dr. Richard Besser said in an April 26 White House briefing. “We’ve created that seed stock, we’ve identified that virus and discussions are under way, so should we decide

to work on manufacturing a vaccine, we can work toward that goal very quickly.” (See “ White House Press Briefing on Swine Influenza.”)

The WHO Emergency Committee met April 27 to determine next steps for the potential pandemic. They raised the phase of pandemic alert from 3 to 4. In Phase 3, an animal or human-animal virus has caused sporadic cases or small clusters of disease in people but has not resulted in person-to person transmission sufficient to sustain community-level outbreaks. Phase 4 is characterized by verified person-to-person transmission of an animal or human-animal flu virus able to cause community-level outbreaks. The change to a higher phase indicates that the likelihood of a pandemic has increased but not that a pandemic is inevitable.

Chan recommended leaving national borders open and international travel unrestricted, and said that seasonal flu vaccine production should not be stopped to produce an H1N1 vaccine at this time unless the situation worsens.