



The Flu Pandemic

As the United States prepares for a possible flu pandemic, numerous misconceptions about the difference between the common flu, a pandemic flu, and an avian flu have arisen. This paper explains the differences between these three types of flu and outlines efforts to protect America from the occurrence of a flu pandemic.

Common Flu

The common flu usually occurs in the fall and winter, is passed through human contact, and according to the Centers for Diseases Control (CDC), is contracted by 5% to 20% of the population of the United States each year. Each year approximately 60 million people are ill and it is estimated that about 36 thousand people die from seasonal influenza. The symptoms of influenza consist of fever, headache, runny or stuffy nose, muscle aches, extreme fatigue, dry cough, and sore throat. Those who are at the highest risk for contracting the flu are children and the elderly.

There are three different strains of influenza virus: (1) Type A influenza, which infects people, birds, pigs, and other animals and which, based on its proteins, is divided into subtypes called hemagglutinin (HA) and neuraminidase (NA); (2) Type B influenza which is normally found only in humans; and (3) Type C influenza, which causes only mild illness in humans.

Each year a flu vaccine is made using three dead flu viruses that will protect against three current strains of influenza virus (one influenza B and two influenza A strains). By using three strains of the most common flu virus, the effectiveness of the vaccine relies on a match between the viruses in the vaccine and the type of flu present. According to the Department of Health and Human Services (HHS), the match occurs about 90 percent of the time. However, the flu is particularly troublesome to prevent, because influenza viruses often mutate or “drift” into a new strain, causing the vaccines to become ineffective.

Pandemic Flu

A pandemic flu differs from the common flu because of its quick and detrimental effects. An influenza pandemic is a global outbreak of disease that occurs when a new influenza A virus appears in the human population causing severe illness and then spreading easily between humans worldwide. According to the CDC, unlike the common flu, “pandemic outbreaks are caused by new subtypes or by subtypes [of influenza] that have never circulated among people or that have not circulated among people for a long time,” and therefore no vaccines are available to combat them.

In the 20th century there were three flu pandemics: the Spanish Flu (1918) resulting in 50 million deaths worldwide, the Asian Flu (1957) with 70,000 deaths in the United States, and the Hong Kong Flu (1968) causing 34,000 deaths in the United States. Numerous studies predict that another flu pandemic is eminent, and has the potential to kill as many as 89,000 to 207,000 people.

Because of the continued spread of avian influenza (H5N1), there is concern that a small genetic shift in this influenza strain could lead to a pandemic influenza outbreak. In the 20th century, three separate outbreaks of pandemic influenza killed over 30 million people. In modern-day society, the potential for pandemic flu is particularly daunting. Since the disease can be passed from one person to the next before they are aware they are infected, it can spread at a rapid rate. Further, the modern world is very urban with millions of people living within a few miles radius of one another. Also, the pandemic flu has the potential to spread more rapidly because of our ability to fly from one country to the next in a matter of hours. The pandemic flu can easily infect a new population across continents. The SARS outbreak in China and the 2004 flu vaccine shortage in America was a glimpse into the kind of chaos an actual pandemic flu would cause. Therefore, early detection of flu pandemic is crucial in order to contain a pandemic flu.

Avian Flu (“Bird Flu”)

Avian flu or the “bird flu” refers to type A influenza strains which are hosted by wild birds that cause illness and death when brought in contact with domestic poultry. There are fifteen subtypes of the influenza virus that are known to infect birds, making it easier for the flu virus to spread amongst them. Avian flu was discovered in Italy more than 100 years ago. The World Health Organization (WHO) has stated that at present “all outbreaks of the highly pathogenic [capable of causing disease] form have been caused by influenza A viruses of subtypes H5 and H7.” Avian influenza viruses do not normally infect species other than birds and pigs, but some animal to human transmission has been recorded in cases involving direct contact with poultry. In those cases, mortality rates are extremely high.

The first documented infection of humans infected by a strain of avian influenza, H5N1 occurred in Hong Kong in 1997, which caused severe respiratory disease in eighteen humans, six of whom died. The infection of humans Unlike the vaccine administered for the common flu, a vaccine to protect against the avian flu is not yet available. As is the case with the common flu, there must be an available sample of the flu strain in order to produce a vaccine to combat avian flu.

Research studies to test a vaccine to protect humans against the H5N1 virus began in April 2005. However, there is difficulty in producing the vaccine due to its high costs and lengthy production time.



Dr. Terrence Tumpey, a microbiologist with the CDC, examines a reconstructed 1918 Pandemic Influenza Virus to identify characteristics that make this organism such a deadly pathogen. Research efforts such as this enable researchers to develop new vaccines and treatments for future pandemic influenza viruses.
- *Centers for Disease Control*

Recent Developments

The federal government is taking action to prepare and prevent a flu pandemic. In 2005, The Centers for Disease Control joined a new, inter-agency National Influenza Pandemic Preparedness Task Force organized by the U.S. Secretary of Health and Human Services. This task force is developing and refining preparedness efforts with international, state, local, and private organizational partners to help ensure the most effective response possible when the next influenza pandemic occurs. In December 2005, Congress approved \$3.8 billion for avian flu research and preparedness. **On May 3, 2006, President Bush published the *Implementation Plan For The National Strategy For Pandemic Influenza*.** This Plan calls for more than 300 actions from Federal departments and agencies and sets clear expectations for State and local governments and other non-Federal entities. It also provides guidance for all Federal departments and agencies on the development of their own plans.

To date there have been no human cases of avian flu reported in the United States. However, the World Health Organization (WHO) published that as of May 8, 2006, human cases of the H5N1 virus have been confirmed in Azerbaijan, Cambodia, China, Indonesia, Iraq, Thailand, Turkey, Vietnam, and most recently, Egypt. The WHO reports that since January 2006, there have been a total of 63 cases, 39 of which were fatal. Many worry that the human virus could be transmitted to other countries. It is important that the efforts to strengthen the defense against potential influenza pandemic continue.

NATIONS WITH CONFIRMED CASES H5N1 AVIAN INFLUENZA (APRIL 27, 2006)



