# AVIAN FLU PANDEMIC PREPAREDNESS IN THE US

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The first human death in Egypt from the so called "Bird Flu" was reported this week in Qalyoubiya, a small town North of Cairo. (Associated Press, 3/19/2006) If initial tests are confirmed this will add another country to those in which human deaths from this disease have been reported. Prior to this, human deaths from the disease had been reported by the World Health Organization in Cambodia, China, Indonesia, Iraq, Thailand, Turkey, and Vietnam – a total of 97 deaths among a total of 176 confirmed cases throughout the world. (The WHO reports only laboratory-confirmed cases.) Thus the disease, originally reported in humans in Viet Nam in 2003, continues to move westward. (Figures from WHO Report, March 10, 2006)

ANALYSIS:

Avian Influenza virus occurs naturally among wild birds throughout the world. The birds carry it in their intestines, but ordinarily, it does not cause illness in them. The virus can infect domesticated birds as well, however, including chickens, ducks and turkeys. These birds can become acutely ill and die from it. Infected birds can shed the virus in their saliva, nasal secretions and feces. Susceptible birds can become infected when they have contact with infected secretions, or surfaces that have been contaminated. Domesticated birds may become infected through direct contact with wild birds, with infected domesticated birds, or through contact with surfaces or materials such as water or feed that have become contaminated. The path of spread among wild birds follows their normal migratory patterns from east to west.

There are two forms of the disease which may be found in domestic birds: a "low pathogenic" form (mild symptoms) and "high pathogenic" form which spreads rapidly through flocks of poultry and has a mortality rate that can reach 90 – 100% within 48 hours.

There are many different subtypes of Influenza A virus. They are distinguished according to certain proteins found on the surface of the virus. The proteins are divided into HA, of which there are sixteen subtypes, and NA, of which there are nine subtypes. Thus, as many as 144 distinct subtypes are theoretically possible.

The risk of these viruses infecting humans is generally low, although several of the subtypes have been found in humans occasionally since 1997. Most of these have been traceable either to direct contact with infected poultry or with surfaces contaminated with their secretions/excretions. The spread of avian influenza virus from one ill person to another has been observed only rarely, and transmission has never been seen beyond one person.

There are only three subtypes of influenza virus A currently circulating among humans, H1N1, H1N2, and H3N2. Symptoms usually consist of fever, cough, sore throat,

and muscle aches, but occasionally progress to eye infections, pneumonia and other severe complications. The predominant symptoms may be related to the virus which caused the infection. The virulent subtype now causing the most concern worldwide is the H5N1 Virus.

Probably the most worrisome characteristic of the type A influenza virus is its ability to readily mutate (change), and take on different characteristics. Thus, although the H5N1 virus is not now readily transmissible to humans, it could adapt over time to become so. And since it does not normally infect humans, there is little immunity against it. The disease could thus spread rapidly in the human population. (See "The Influenza Pandemic of 1918) by M. Billings, Stanford University Publication, February 2005.)There is already evidence that it is becoming more capable of causing disease in mammals than it was previously. (See associated press article regarding transmission to a stone marten in Germany, March 10, 2006) (Technical information on the H5N1 virus from CDC Publication dated February 7, 2006)

Current studies suggest that the H5N1 virus is resistant to two antiviral medications commonly used in humans for influenza. Two others would probably work, but additional studies still need to be done. Of these two, only Tamiflu, manufactured by Roche, is currently approved by the FDA for treatment of the disease. Since Tamiflu is in short supply as yet, counterfeit forms are being developed and sold around the US. There is, of course, no evidence that these fake forms will have any activity against the virus. (See Newsweek article by A. Bower, dated Feb 25, 2006.) Thus far, there is no proven effective human vaccine, although there are some under development.

Much is being done nationwide and worldwide in an attempt to prevent the development of a flu pandemic. An official US Government website has been established ("PandemicFlu.gov") to disseminate information about the disease and what the US and other countries are doing to prevent its spread. Individual States have held summit meetings in order to discuss and formulate steps that can be taken in prevention and treatment. But what is being done at the grass roots level, that is at the places where patients are likely to come for treatment is less reassuring.

An article appearing in Genetic Engineering News, 3/16/2006, reports a study of 267 hospitals by VHA, a national health alliance that provides supply chain management services serving health care organizations across the country. Most of the reporting hospitals stated they had a disaster plan in place. They admitted, however, that their stockpile of supplies most likely to be needed in the event of a large flu outbreak was limited to an amount calculated to last 16 days or less. These supplies included such items as anti-viral medications, masks, gloves, gowns, and IV supplies. Only the largest health systems maintained a 4-week supply of the key medical products. (The Department of Health and Human Services recommends that hospitals stockpile enough consumable resources to last the duration of a pandemic wave, i.e. approximately six to eight weeks.) It is interesting to note that almost all of such supplies are made in places like China, Singapore and Malaysia, the potential hotspots which are likely to see a pandemic first. An outbreak there would have a serious dampening effect on the

manufacture and transporting capability of these items. This, in turn, would severely impact US hospitals' ability to care for patients.

Business corporations, which supply other services essential in treating a worldwide pandemic do not seem to be doing much better in the way of preparedness. (See New York Times article "Is Business Ready for a Flu Pandemic?" by E. Rosenthal and K Bradsher, dated 3/16/06.) Airlines, for example, would have to fly health experts around the world, and rush supplies to the front lines. Banks would need to ensure that money can be moved quickly. News outlets must continue to operate in order to disseminate essential information. Many of these essential functions would have to continue despite a depleted work force. Yet many US companies have only rudimentary contingency plans in place. Asian companies, in contrast, have done better, probably because a bird flu virus has been present there for years. The 2003 outbreak of Sudden Acute Respiratory Syndrome ("SARS") brought commerce almost to a standstill in Hong Kong, Singapore and Beijing. Many companies there have detailed plans that could be quickly put into place, as well as a specifically named individual in charge of implementing them. The plans often include provisions for employees to work at home to prevent the spread of disease in the office, and to divide work among multiple sites in order to isolate a group of workers at one site in the event that another site has workers with the disease. Other methods of preventing spread include holding teleconference rather than face-to-face meetings of many individuals, and use of disinfectant hand washes in offices.

It is certainly to be hoped that those in charge of both direct patient care and supporting services here at home will begin to take more seriously the problem of Avian Flu Pandemic preparedness.

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