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# Public Health and You

**Monday Morning Epi for 1/12/04**

**Smuggler's Blues**

Three executives from a poultry vaccine company in Maine face federal charges of conspiracy and mail fraud for smuggling an avian influenza (AI) virus into the US from Saudi Arabia to produce a vaccine. Apparently a Saudi poultry producer was experiencing an outbreak of AI in one of its flocks but did not want government authorities to find out. Thus, they paid $895,704 for the Maine vaccine company to "secretly" develop a vaccine against the offending strain. After producing the illegal vaccine, company officials falsified their production records and shipping documents to send 8000 vials to the Saudi customer.

Avian influenza is caused by type A influenza virus. AI viruses, like human influenza A viruses, are subdivided into strains (or subtypes) based on their hemagglutinin (H) and neuraminidase (N) surface antigens. In addition, AI viruses can be classified into low pathogenic (LPAI) and highly pathogenic (HPAI) forms based on the severity of the illness they cause in birds. Some LPAI virus strains are capable of mutating under field conditions into HPAI viruses. Historically, serotypes including H5 and H7 have been associated with severe disease in poultry. The AI subtype smuggled into the US by the Maine company was H9 (considered to be LPAI).

Avian influenza viruses can infect chickens, turkeys, pheasants, quail, ducks, geese, and a wide variety of other birds. The symptoms can vary from a mild disease with little or no mortality to a highly fatal, rapidly spreading epidemic. Waterfowl act as a reservoir of avian influenza; the virus is shed in their feces. AI viruses are transmitted through direct fecal contact or through inhalation of viral particles in nasal and respiratory secretions. Among domestic poultry species, turkeys are more commonly infected than chickens.

Vaccines can prevent clinical signs of AI infection in poultry; however, using vaccination as an overall prevention and control method is limited by the lack of cross-protection among the different AI strains. A vaccination program, in conjunction with strict quarantine, has been used to control mild forms of the disease in commercial chicken and turkey flocks. With HPAI strains, strict quarantine and rapid depopulation of infected flocks are the only effective control methods. Since wild birds and their excreta are considered major sources of avian influenza, the primary prevention methods for AI in domestic poultry include limiting direct contact with free-flying birds.

Avian influenza has widespread and potentially devastating agricultural, economic, and human health implications. Eradication of an HPAI outbreak (caused by H5N2 strain) that occurred during 1983 and 1984 in the northeastern United States resulted in the destruction of more than 17 million birds at a cost of nearly $65 million. This outbreak also caused retail egg prices to increase by more than 30 percent.

Several strains of HPAI virus have been shown under natural conditions to be zoonotic (infectious to people). The H5N1 strain isolated in Hong Kong in

1997 was highly pathogenic for chickens and also resulted in 18 human infections. Six of these persons died. Approximately 1.4 million chickens were destroyed in Hong Kong to remove the source of the virus. In February 2003, two human cases of influenza A (H5N1) infection occurred in a single family of Hong Kong residents who had recently traveled to Fujian Province on mainland China. Both patients were hospitalized and one died. Between February and April 2003, the Netherlands reported outbreaks of highly pathogenic avian influenza A (H7N7) among poultry, pigs and humans. As of late April 2003, this outbreak resulted in eighty-three (83) confirmed cases of human H7N7 influenza virus infection, primarily among poultry workers and their families.

Both influenza A (H5N1) and influenza A (H7N7) are influenza viruses that have not circulated widely among people in the past; therefore, the general population has little or no immunity to the viruses. When a novel influenza virus infects a person, the situation needs to be monitored very closely because of the potential for an influenza pandemic to occur (in the event that the virus causes illness and is able to spread efficiently from person to person). Three influenza pandemics occurred in the 20th century, the most devastating of which was the pandemic of 1918-19, during which more than 550,000 people in the United States died of influenza-related complications.

Practical Considerations

The advent of BSE in the United States and this smuggling case underscore the need for Agriculture and Public Health agencies to work together to develop clear plans for the detection, investigation, and response to foreign animal (or other emerging) diseases in this country. Just as we have often stated that diseases do not have geographic borders, in many cases they do not have species borders as well.

Depending on intent, the emergence of a disease among animal populations or other agricultural commodities could be agroterrorism. Agroterrorism involves the act of any person or group knowingly using biological agents as weapons against the agricultural industry and the food supply (remember the ripple effect may also include human disease). Agroterrorism is another face of bioterrorism and should be treated accordingly in bioterrorism planning and preparedness efforts.

Poultry is the top agricultural commodity in Georgia (it is a $10 billion/year industry!). Exports alone are worth more than $300 million dollars annually. As a result of LPAI outbreaks in Pennsylvania, North Carolina, and Virginia in 2002, Georgia initiated legislation dictating that any chickens coming into Georgia from another state must be certified to come from an avian influenza-free flock. To date, there has never been an outbreak of AI in Georgia.

There may be considerable overlap between the clinical presentation and travel history of persons who may have SARS and those who should be evaluated for infection with influenza A (H5N1 or other avian strains). Influenza A infection should be considered in the differential diagnosis when evaluating a suspect SARS patient. Priority should be given to subtyping influenza A viruses isolated from potential SARS cases.

**Trivia Circle**
Where is the "Chicken Capital of the World"?

"Monday Morning Epi" was bought to you by
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With thanks to: CDC, USDA, MMWR, and UGA CVM

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