AVIAN FLU CONCERNS ESCALATE WORLDWIDE

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Avian influenza ("bird flu" as it is sometimes called in the press) is making its way into the news almost daily and causing worry among global health authorities, including the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), and the National Institute of Allergy and Infectious Diseases (NIAID). Avian influenzas are not new; they come in many types with widely varying levels of disease-causing capability.

> **Definition:** Influenza type A viruses, which include human and avian flu viruses, are categorized by H and N components, which denote specific types of proteins on their surface. The H component governs the ability of the virus to bind to and enter cells, which become virus-making factories. The N component governs the release of the newly made viruses from the animal host cell." [Reuters alertnet, 16 Nov 2005, edited.] There are 16 different HA subtypes and 9 different NA in type A influenza viruses. "There are only three known A subtypes of human flu viruses (H1N1, H1N2, and H3N2). When discussing "bird flu" we are talking about the influenza A subtypes chiefly found in birds. They do not usually infect humans, even though we know they can. [*Fact Sheet, Avian Influenza*, William T. Ferrier, DVM - prepared for falconers.]

The virus making headlines is a specific subtype–H5N1–but there is more than one form of H5N1, specifically high- and low-pathogenic strains. The high-pathogenic form of H5N1 is the one in Asia that is causing global concern. There has been a low-pathogenic form of H5N1 found in migrating wild birds in Canada this fall, which is no cause for alarm. There have been other subtypes of avian influenza viruses found periodically in North America that have caused a need to cull domestic poultry at affected farms, but these have posed no threat to humans.

WHY THE CONCERN? Highly pathogenic avian influenza ("HPAI") virus H5N1 has already jumped the species barrier from birds to people, as well as from birds to pigs and cats. So far, there has been only one suspected case of human-to-human transmission, but the major fear is that "regular" flu and avian flu might link up in a human (or a pig, which can be susceptible to both human and avian viruses). This would create a new influenza strain that (1) could be transmitted from human to human and (2) would encounter virtually no existing resistance in the human population. The HPAI H5N1 virus has also been found to cause serious disease and death among its wild bird hosts–unusual for an avian flu virus–and is certainly highly lethal and contagious among domestic fowl. It has most recently spread into eastern Europe in wild and domestic birds (with no human cases).

Among all the headlines and reports from places around the world, two concerns are often being confused, if the phone calls we receive are any indication. The first concern is (1) that the "bird flu" is here in the US or might come here and infect people (this fear already causes unease when a dead bird is found); (2) the second, much more valid,

concern is that this serious bird disease could combine with a human flu virus to cause a disease that easily jumps from person to person.

WHAT IS IT? The scientific name of the existing "bird flu" virus is *highly pathogenic* a*vian flu H5N1.* It was first found in Hong Kong poultry in 1997. There are at least 15 types of avian flu world-wide. Avian flu can be passed from wild birds to domestic birds, primarily where the latter are free range and/or packed tightly together in less than hygienic situations. The virus is shed in saliva, droppings, and nasal secretions. In rural areas, the H5N1 virus is easily spread from farm to farm among domestic poultry through the feces and secretions of *wild* birds. The virus can survive for up to four days at 71º F (22º C) and more than 30 days at 32º F (0º C). If frozen, it can survive indefinitely. As with many viruses, there seem to be different levels of susceptibility among species of birds. Chickens and waterfowl seem very susceptible; a few wading birds have been found with it and, as far as has been reported, only one raptor. Waterfowl are the typical reservoir hosts for all the subtypes of avian influenza, but the HPAI H5N1 virus is unusually virulent among its host birds.

New research suggests that H5 avian viruses are becoming more capable of causing disease in mammals than earlier avian viruses and are becoming more widespread in birds in Asia. One study found that ducks infected with H5N1 are now shedding more virus for longer periods of time without showing any symptoms of illness than is common with earlier viruses. This has implications for the role of ducks in transmitting disease to other birds and, possibly, to humans as well. Additionally, other findings have documented H5 infection among pigs in China and in felines (experimental infection in house cats in the Netherlands and isolation of H5N1 viruses from infected tigers and leopards in Thailand), suggesting that cats could host or transmit the virus - though none are thus far implicated in human cases of H5N1 [see **http://www.cdc.gov/flu/avian/outbreaks/asia.htm**] These finding are particularly worrisome because re-assortment of avian influenza genomes is most likely to occur when these viruses demonstrate a capacity to infect multiple species, as is now the case in Asia.

HOW IS IT DIFFERENT FROM REGULAR FLU? Humans have their own flu (influenza), caused by an influenza virus that infects the respiratory tract (nose, throat, lungs). Because it is a disease primarily of the respiratory system, it is easily spread between people through sneezing or coughing. Unlike many other viral respiratory infections, such as the common cold, the flu causes severe illness and life-threatening complications in many people. Each flu season is different, but the CDC estimates that each year, on average, between 5% and 20% of the US population gets the flu, more than 200,000 people are hospitalized for flu-related complications, and about 36,000 die from complications of flu.

The CDC monitors influenza outbreaks around the country and helps vaccine manufacturers decide what is likely to be the predominant strain each year, so that vaccines can be produced. "It's important to remember that there are different types of influenza viruses circulating and different variants within virus types, and the same type of flu virus does not necessarily circulate each year. For instance, during the 2003-04 flu season, influenza A (H3N2) viruses predominated; however, infection with an influenza

A (H3N2) virus would not provide protection against influenza B or influenza A (H1N1) viruses." [http://www.cdc.gov/flu/about/qa/disease.htm]

So it is easy to understand why health authorities and government officials are concerned that a human influenza virus might at some point combine with the HPAI H5N1 virus, causing a lethal virus that easily jumps from person to person.

WHERE HAS IT BEEN FOUND? During the first HPAI H5N1 outbreak, several people died and some 1.5 million chickens and ducks were killed to contain the virus. H5N1 reappeared in late 2003, is presently being found in poultry, and has infected over 100 humans in eight Asian countries, most in Viet Nam and China. In late summer/fall 2005 it was also isolated in sick wild birds and poultry in Russia, Romania, Croatia, Turkey, and Mongolia. In the Asian outbreaks that have involved humans, the infected human patients infected apparently had direct contact with infected chickens or ducks and their droppings or secretions. Over 100 people in Asia have become ill since January 2004, and at least 60 have died thus far.

Avian influenzas of many different types have been found all over the world, particularly now with the increased surveillance and testing in place. When it does, it is of course now making the news wherever it crops up - whether or not it is related to the HPAI H5N1 virus.

WHAT IS THE PRIMARY CONCERN FOR PEOPLE? For most of the world, direct transmission of HPAI H5N1 from fowl to humans is very unlikely. There have been no cases that indicate transmission from *wild* birds to people, even in Asia. However, if H5N1 mutates and combines with a human influenza virus, it could potentially spread from person to person through the air in the same way ordinary flu virus spreads. In that case, it will be easy to pass along an infection. A sneeze or cough in a crowded room could infect hundreds of people. With current airline traffic, that sneeze could pass around the world in a matter of days.

As a result, authorities are deeply concerned that a possible “pandemic” could kill millions of people around the world. The CDC defines an influenza pandemic as a global outbreak of disease that occurs when a new influenza A virus emerges in the human population, causes serious illness, and then spreads easily from person to person. Pandemics are different from seasonal outbreaks or epidemics of influenza, which kill thousands of people, particularly the very young and elderly, each year. Seasonal outbreaks are caused by subtypes of influenza viruses that are already in existence among people, whereas pandemic outbreaks are caused by new subtypes that have never circulated among people or that have not circulated for a long time.

Efforts to produce a vaccine that would be effective against this strain of influenza A H5N1 are under way. Vaccine reference virus strains already have been made and been provided to manufacturers to produce pilot lots for human clinical trials as well as to produce a larger quantity of H5N1 vaccine, but mass production and availability of such a vaccine is some time off. The U.S. government has budget $7 billion for responding to a potential pandemic, is testing an experimental bird flu vaccine, and is stockpiling antiviral drugs for possible emergency use as well as to test whether these drugs can maintain their potency over time.

HAS THIS HAPPENED BEFORE? The three influenza pandemics of the 20th century all spread worldwide within a year: In1918-1919, "Spanish flu" killed more than a half-million people in the U.S., and as many as 20-50 million worldwide. Many victims died within the first few days of being infected, and others of complications soon after. Nearly half of those who died were young, healthy adults. In 1957-58, a flu pandemic killed about 70,000 people in the U.S. It was first identified in China in February 1957, and it arrived in the United States by June of that year. In 1968-69, the "Hong Kong" flu claimed some 34,000 lives in the U.S. Strains of this virus still circulate today.

Viruses containing a combination of genes from a human influenza virus and an avian influenza virus caused both the 1957-58 and 1968-69 pandemics. The origin of the 1918-19 pandemic virus has only recently been determined to have also been based on an avian influenza. Past influenza pandemics have led to high levels of illness, death, social disruption, and economic loss. It is no surprise that health experts are doing everything they can to be proactive against this potential new and serious threat.

WHAT IS BEING DONE? Officials acknowledge that one of the biggest challenges in controlling avian flu is education about the need to alter traditional farming practices in Asian countries where chickens, ducks and other animals live in close, and often unsanitary quarters, with people. Because this is part of the Asian culture and tradition, eradication of the disease there is nearly impossible. Human exposure to HPAI H5N1 is far less likely to happen in other parts of the world.

WHAT CAN YOU DO TO PROTECT YOURSELF? Although everyone should be paying attention to news reports on this issue, and certainly travelers to SE Asia should check CDC travel advisories, *H5N1 is not yet a threat in this country* and really not likely to be one. Please check out the bulletin from the Southeastern Cooperative Wildlife Disease Study at the University of George College of Veterinary Medicine [www.eRaptors.org/avian flu]. It's one of the clearest discussions of this topic among many I've seen in the last year.

Keep yourself healthy in the meantime and limit the chances you'll catch even the run-of-the-mill human flu that circulates each winter. But don't worry about the birds in your backyard.

For further information*:*

Current findings, good basic background, and FAQs*:*
http://www.msnbc.msn.com/id/4067116/ -

Centers for Disease Control: http://www.cdc.gov/flu/avian

CDC Public Inquiry **E-mail:dvd1spath@cdc.gov;** Public Inquiry Phone: 404-639-1510;

Website: **http://www.cdc.gov/ncidod/dvrd/spb/index.htm**

Southeastern Cooperative Wildlife Research Study:
http://www.uga.edu/scwds/avianinfluenzainformation.html

USDA APHIS Veterinary Services:
http://www.aphis.usda.gov/lpa/issues/avian_influenza/index.html
USGA National Wildlife Health Center:
http://www.nwhc.usgs.gov/research/avian_influenza/avian_influenza.html