Avian Influenza–Science at the Forefront

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USGS National Wildlife Health Center

Highly Pathogenic Avian Influenza H5N1 Frequently Asked Questions January 2006

What is avian influenza?

- Bird flu, the popular name for avian influenza (AI), is a disease primarily found in poultry and wild birds. Avian influenza can infect chickens, pheasants, quail, ducks, geese, and guinea fowl, as well as migratory waterfowl and shorebirds and, less commonly, mammals (pigs, horses, and marine mammals).
- The virus can be spread through contact with fecal droppings, saliva, and nasal discharges of infected animals.
- When the virus "jumps" to a new species, such as from wild birds to domestic animals or to humans, the virus may change or mutate into a new virus that is more adapted to the new host and is no longer the same virus that was originally in the wild bird population.

What are the differences between low pathogenic and highly pathogenic avian influenza viruses and how are influenza viruses grouped?

- The designation of low or highly pathogenic avian influenza refers to the potential for these viruses to kill domestic poultry. The designation of "low pathogenic" or "highly pathogenic" does not refer to how infectious the viruses may be to humans.
- Most strains of avian influenza are not highly pathogenic and cause few signs in infected wild birds; however, in poultry, low pathogenic strains can mutate into a highly pathogenic avian influenza (HPAI) strain that causes extremely contagious, severe illness, and often death, in poultry.
- Influenza viruses are also differentiated by two proteins, hemagglutinin (H) and neuraminidase (N), which are found on the surface of the virus. There are 144 theoretical combinations of the 16 different H and 9 different N proteins that make up the subtypes of avian influenza.
- These subtypes can be further genetically differentiated into strains. A subtype such as the highly pathogenic H5N1 avian influenza virus may have multiple strains. These different strains may be more or less pathogenic to domestic poultry, wild birds, and humans.
- Highly pathogenic avian influenza viruses in poultry are usually H5 or H7 subtypes of Type A influenza, although low pathogenic forms of these H5 and H7 viruses also exist.
- If a strain of the HPAI mutates to become easily transmissible from human-to-human, the new strain would then be considered a human Type A influenza virus.

Why is this new strain of avian influenza causing such alarm?

- This particularly virulent new strain of highly pathogenic avian influenza (HPAI H5N1) has spread throughout a large geographic area in Asia and Eastern Europe since it was first documented in 1997 in Asia, and has caused the largest and most severe outbreaks in poultry on record.
- The human cases to date have been in Eastern Europe (Turkey) and Asia, primarily in Cambodia, China, Indonesia, Thailand, and Vietnam, and have been the result of direct or close contact with domestic (not wild) birds, especially chickens.
- Unlike most avian influenza viruses, this new strain of H5N1 has caused mortality in over 60 species of wild birds.

*adapted, with permission, from the Wildlife Conservation Society

How has this new strain of AI affected humans so far?

• As of January 10, 2006, the new strain of HPAI H5N1 has caused illness in 147 people and the death of at least 78 people, mostly in Cambodia, China, Indonesia, Thailand, Vietnam, and most recently Turkey.
• So far, there has been no sustained person-to-person transmission of the HPAI H5N1 virus.
• Most of the people who have been infected with the HPAI H5N1 virus have acquired it through direct handling of infected poultry, eating uncooked or undercooked poultry products, or through contact with virus-contaminated surfaces or materials, including blood and feces.
• There are *no* documented cases of human H5N1 disease resulting from contact with wild birds.
• Public health organizations, such as the World Health Organization and the Centers for Disease Control and Prevention, are concerned that the virus could mutate into a human virus that would be more easily transmissible from person-to-person. This change could pose a global influenza pandemic threat.

For additional information about AI and humans, visit:

http://www.pandemicflu.gov/
http://www.cdc.gov/flu/pandemic/
http://www.who.int/csr/disease/avian_influenza/avian_faqs/en/#areall

What countries have confirmed the presence of HPAI H5N1?

• Between November 2003 and March 2004, HPAI H5N1 spread to at least nine countries in Southeast Asia, causing huge losses of poultry, widespread economic loss and some loss of human life.
• By August 2005, bird flu outbreaks, mainly in domestic poultry, were reported in eight territories and republics in Russia; up to five provinces in Kazakhstan; Hosvgol, Mongolia; and Lhasa, Tibet.
• In the fall of 2005, this new strain was detected in Turkey, Romania, Croatia, and parts of European Russia.

Has highly pathogenic H5N1 been found in North America?

• Researchers have no evidence that the Asian strains of highly pathogenic avian influenza H5N1 are present in wild birds or poultry in the North American continent.
• Low pathogenic forms of H5 and H7 have occurred in both domestic and wild birds in North America and around the world in the past. Researchers do not know what causes a fairly benign H5 or H7 strain to change into a strain that is highly pathogenic.

MIGRATORY BIRD QUESTIONS

What kinds of wild birds primarily carry avian influenza?

• Most avian influenza viruses have been isolated from wild waterfowl (ducks, geese, and swans) and shorebirds (wading birds), gulls, and terns.
• With rare exception, the thousands of flu isolates found in wild birds have been low pathogenic avian influenza and have rarely caused signs of illness.
• The occurrence of avian influenza in wild ducks in North America reaches its height in late summer and early fall. At other times of the year, infection rates are usually less than 1 percent.
• In shorebirds, infection rates are highest during the spring migration, although in comparison with waterfowl, their infection rates are much lower.

Has HPAI H5N1 affected migratory birds differently than other avian influenza viruses in the past?

• Yes. In May 2005, HPAI H5N1 was detected for the first time in wild birds in Qinghai, China, where bar-headed geese *(Anser indicus)* died. This marked the first time since 1961 in which large numbers of wild birds have died from avian influenza.

• In this May 2005 outbreak in China, researchers estimate that 5 to 10 percent of the world's population of bar-headed geese may have perished.
• Most of the wild birds confirmed as having HPAI H5N1 have been sick, dying, or dead, although there are some reports of apparently healthy wild birds infected with HPAI H5N1.

Are migratory birds carrying the virus from one country to another?

• The role of migratory birds in the transfer of the Asian H5N1 strain is not clear. Wild birds have been suggested, but to date they have not been confirmed, to be the source of new outbreaks. The pattern and timing of several outbreaks have not coincided with periods of major migratory movements or migratory routes. However, there are also reports of wild bird mortality that are associated with outbreaks of HPAI H5N1 in poultry. It is not known if wild birds were the source of the virus or acquired the virus from poultry, although once infected they could be a potential source of infection for domestic poultry that are not isolated from wild birds.

Can humans catch avian influenza from wild birds?

• There are *no* documented cases of human H5N1 disease resulting from contact with wild birds.
• The only documented cases of transmission to humans are from poultry; these cases include both highly pathogenic and low pathogenic strains of avian influenza.
• At the present time, close contact with infected domestic poultry has been the primary way that people have become infected with the HPAI H5N1 virus.

What are the potential routes for a pathogenic strain of avian (or human) influenza to arrive in North America?

• Bird migration is only one possible route of introduction of HPAI H5N1 into North America.
• Illegal smuggling of birds and poultry products, travel by infected people or people traveling with virus-contaminated articles are more direct, and possibly more likely, means of introducing the new strain of HPAI H5N1 virus into the United States.

Where are the most likely routes that H5N1 could enter the United States through migratory birds?

• Migratory birds usually travel the same routes in their annual migrations. In the Northern Hemisphere, birds begin moving south during August and September of each year. North American migratory birds that over-winter in Asia may come into contact with potentially infected domestic or wild birds during the winter months.
• In spring, migratory birds will migrate north to their breeding grounds in eastern Russia, Alaska, and Canada. Migratory birds infected with the HPAI H5N1 returning from Asia can potentially interact with other North American wild birds as they co-mingle on the breeding grounds.

What can we do to protect ourselves?

• As a general rule, people should observe wildlife, including wild birds, from a distance. This protects people from possible exposure to diseases and minimizes disturbance to the animal.
• Avoid touching wildlife. If there is contact with wildlife, do not rub eyes, eat, drink, or smoke. Thoroughly wash your hands with soap and water.
• Do not pick up diseased or dead wildlife.
• Contact your state, tribal, or federal natural resource agency if you find a sick or dead animal.

For other protection advice unrelated to wildlife, please go to
http://www.pandemicflu.gov/

What is the Department of the Interior's responsibility in investigating and handling avian influenza issues?

- DOI is responsible for managing and protecting wildlife, including migratory birds, under various laws and treaties, and for protecting public health on more than 500 million acres of land that it manages across the country.
- To carry out these responsibilities, the Department and its partners are investigating HPAI H5N1 in migratory birds. DOI is also making plans to protect the health of its employees and the 450 million people that visit Department-managed lands each year.

Which bureaus in the Department of the Interior have roles in efforts related to avian influenza?

- The U.S. Geological Survey (USGS). The USGS is the scientific arm of the Department and has a long history of responding to wildlife disease emergencies and conducting wildlife disease investigations. The USGS is also supporting international HPAI research efforts by contributing information and world-class expertise about migratory birds and bird movements.
- The U.S. Fish and Wildlife Service (FWS). The FWS is the federal wildlife management agency within the Department. The FWS administers the National Wildlife Refuge System, with many of its 545 refuges providing critical nesting, migration, and wintering habitat for waterfowl and other migratory birds. FWS also carries out permitting and enforcement responsibilities under federal laws governing trade in wildlife species and products, and works with the U.S. Department of Agriculture to regulate the importation of wild birds for the pet trade, research, and other purposes.
- The National Park Service (NPS). With 388 areas in the NPS, the NPS has a key role in protecting the health of its visitors. The NPS hosts 32 commissioned officers of the U.S. Public Health Service to meet this important responsibility.

What is the Department of the Interior doing to check wild migratory birds for avian influenza?

- USGS and FWS, in collaboration with State of Alaska biologists, have been strategically sampling migratory birds for H5N1 in the Pacific Flyway for several months. These efforts complement a series of ongoing avian influenza studies being conducted by the USDA and its university partners in Alaska, where birds that regularly migrate between Asia and North America are known to congregate and to nest.

Where will DOI surveillance efforts be focused next:

- The U.S. Geological Survey, U.S. Fish and Wildlife Service, and U.S. Department of Agriculture are planning a coordinated and more comprehensive surveillance and detection program for 2006. This program will serve to provide an early warning to the agriculture, public health, and wildlife communities should migratory birds be found to carry this particular virus.

HUNTERS/VISITORS TO FEDERAL LANDS AND TRUST SPECIES WELFARE

Should hunters be concerned about avian influenza?

- There are no documented cases of wild birds directly transmitting avian influenza to people.
- There is currently no indication that waterfowl or other wild birds hunted in the United States carry HPAI H5N1.
- While experts believe the risk to hunters is currently low, scientists cannot guarantee that there is no risk. It is always wise to practice good hygiene when handling or cleaning any wild game.
- Concerned hunters should take the precautions listed in the fact sheets referred to below, participate in harvest surveys where they occur, and keep up with new information on HPAI H5N1.

For more information see the:

Alaska Hunter Fact Sheet
http://www.adfg.state.ak.us/news/avian_bulletin_9-30-05.pdf
USGS Wildlife Health Bulletin
http://www.nwhc.usgs.gov/research/WHB/WHB_05_03.html
World Health Organization Safe Food Preparation Guide
http://www.fao.org/newsroom/en/news/2005/1000172/index.html

Has AI been found on any National Wildlife Refuge?

• The HPAI H5N1 strain of avian influenza has not been detected in North America, including on any National Wildlife Refuge, National Park, or any other Department of the Interior Trust lands. Other low pathogenic strains of avian influenza, however, are commonly present in waterfowl and shorebirds.

Other Sources of Information:

• Pandemicflu.gov http://www.pandemicflu.gov/
• USGS National Wildlife Health Center
http://www.nwhc.usgs.gov
• U.S. Department of Agriculture
http://www.usda.gov/wps/portal/!ut/p/_s.7_0_A/7_0_1OB?navid=AVIAN_INFLUENZA&navtype=SU
• Centers For Disease Control
http://www.cdc.gov/flu/avian/index.htm