FACT SHEET

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SCREENING FOR HIGHLY PATHOGENIC H5N1 AVIAN INFLUENZA IN MIGRATORY BIRDS

"An Early Detection System for H5N1 Highly Pathogenic Avian Influenza in Wild Migratory Birds -- U.S. Interagency Strategic Plan"

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Avian influenza (AI) is a virus that is naturally found in wild birds, particularly in certain species of waterfowl and shorebirds. Occurrences of an H5N1 highly pathogenic avian influenza (HPAI) virus overseas have heightened concern regarding the potential impact on wild birds, domestic poultry and human health should it be introduced into the United States.

To understand the differences and potential threats to U.S. bird populations, this fact sheet provides definitions, a historical perspective and an outline of the U.S. Department of Agriculture (USDA) and U.S. Department of the Interior (DOI) efforts to detect the H5N1 HPAI virus in wild migratory birds.

BACKGROUND

ABOUT THE VIRUS

AI viruses are classified by a combination of two groups of proteins found on the surface of the virus: hemagglutinin proteins (H), of which there are 16 (H1-H16), and neuraminidase proteins (N), of which there are 9 (N1-N9). There are 144 possible combinations or subtypes based upon this classification scheme.

Wild birds, in particular certain species of waterfowl and shorebirds, are considered to be the natural reservoirs for avian influenza viruses. These subtypes that naturally occur in wild species usually cause little or no disease. However, domestic birds are generally more susceptible to avian influenza virus and mutation or recombination of a virus acquired from wild birds can increase its disease potential in these domestic birds.

AI strains also are divided into two groups based on the pathogenicity of the virus--the ability of the virus to produce disease.

Low Pathogenicity Avian Influenza (LPAI): Most AI strains are classified as low pathogenicity and cause few clinical signs in infected birds. LPAI generally does not pose a significant health threat to humans. However, LPAI is monitored because two strains of LPAI—the H5 and H7 strains–can mutate into highly pathogenic forms.

High Pathogenicity Avian Influenza (HPAI): This type of avian influenza is frequently fatal to birds and easily transmissible between susceptible species. The strain that is currently of concern in Asia, Europe, the Middle East and Africa is the H5N1 HPAI virus.

TIMELINE

Since 1997 when it first appeared in Hong Kong, federal wildlife experts and public health officials have been monitoring the spread of the highly pathogenic H5N1 virus**.**

Since 1998, USDA, in partnership with the University of Alaska, has tested over 12,000 wild migratory birds in the Alaska flyway and almost 4,000 wild migratory birds in the Atlantic flyway. All birds have tested negative for the highly pathogenic H5N1 virus.

DOI and USDA stepped up wild bird monitoring and testing programs when the highly pathogenic H5N1 virus spread throughout Southeast Asia and Russia.

Since summer 2005, DOI biologists have been working with the State of Alaska to sample migratory birds for H5N1 in the Pacific Flyway. DOI has tested more than 1,700 samples from more than 1,100 migratory birds. There have been 22 avian influenza isolates identified, but none have been highly pathogenic.

In August 2005, as part of the President's National Strategy for Pandemic Influenza Preparedness, the USDA and DOI convened a joint working group with the U.S. Department of Health and Human Services (HHS), State of Alaska and the International Association of Fish and Wildlife Agencies to develop a national strategic plan for early detection of H5N1 HPAI should it be introduced into North America by wild birds.

THE WILD BIRD PLAN

PLAN OVERVIEW

The interagency strategic plan, developed by wildlife disease biologists, veterinarians and epidemiologists, provides a unified national system for conducting H5N1 HPAI monitoring of wild migratory birds throughout the United States. The plan serves as a guide to all federal, state, university and non-governmental organizations involved in avian influenza monitoring by providing standard procedures and strategies for data sampling, diagnostics, and management.

FIVE STRATEGIES OF THE PLAN

The plan targets bird species in North America that have the highest risk of being exposed to or infected with highly pathogenic H5N1 because of their migratory movement patterns. Key species of interest include ducks, geese, and shorebirds.

If wild birds are or become able to effectively move the disease over great distances, scientists believe introduction of H5N1 into the United States would most likely occur in Alaska, where there is significant mixing of Asian and North American birds. Therefore, the interagency

strategic plan recommends a prioritized sampling system with emphasis first in Alaska, the Pacific Flyway and Pacific Islands, followed by the Central Flyway, Mississippi Flyway and Atlantic Flyway. The five strategies are:

1.) **Investigation of morbidity/mortality in wild birds**: The systematic investigation of significant numbers of sick or dead birds offers the highest and earliest probability of detection, if the highly pathogenic H5N1 virus is introduced into the United States by migratory birds. Biologists and veterinarians in state and federal wildlife and natural resource agencies and animal health agencies and organizations, are prepared to detect and respond to such discoveries. In the event that a highly pathogenic H5N1 is detected in wild birds, USDA will identify and monitor domestic poultry and swine operations in the area and minimize contact between the wild birds and domestic animals.

2.) **Monitoring live, apparently healthy wild birds:** This effort targets wild birds in North America that represent the highest risk of being infected with highly pathogenic H5N1 avian influenza, because of their migratory movement patterns. Species that will be sampled include birds that migrate directly between Asia, Oceania (including Hawaii, U.S. Pacific Territories and Freely Associated States) and North America, and birds that might be in contact with species from areas in Asia with reported avian influenza outbreaks. This includes sampling live-captured, apparently healthy wild birds to detect the presence of highly pathogenic H5N1 virus. Data collected in Alaska will be combined with data from additional bird captures to provide a broad species and geographic monitoring effort. In 2006, DOI, USDA and their cooperators plan to collect 75,000 to 100,000 samples from live and dead wild birds.

3.) **Monitoring hunter-killed birds:** Hunter check stations operated by the FWS and state natural resource agencies for waterfowl hunting provide an opportunity to collect additional samples to test for the presence of highly pathogenic H5N1 and other subtypes of avian influenza. These samples supplement the targeted monitoring samples from live wild birds and focus on species that are most likely to have been exposed to highly pathogenic H5N1 viruses in Asia; have relatively direct migratory pathways from those areas to the United States via Alaska or directly to the Pacific Coast; or that mix in migratory staging areas in Alaska with species that could bring the virus from Asia. Collection of samples from these species will occur at hunter check stations in the lower 48 states, as well as Alaska, during hunting seasons in areas where these birds gather during migration or over-wintering. Samples also will be collected from wild birds taken by native Alaskans during the spring subsistence hunt. USGS, FWS and USDA are working with the four Migratory Bird Flyway Councils to enhance sampling plans for hunter-killed birds.

4.) Use of sentinel animals: There are two groups of animals used as sentinels in avian influenza monitoring programs that could provide early detection of the highly pathogenic H5N1 virus along migratory flyways in the United States. Poultry flocks reared in backyards (raised for noncommercial purposes) have been evaluated for diseases of interest to nearby commercial poultry operators as a monitoring method. Also, duck flocks can be placed in wetland environments where they may commingle with wild birds. The ducks are then monitored and tested for avian influenza viruses.

5.) **Environmental sampling of water and bird feces:** Waterfowl release avian influenza viruses through the intestinal tract and the virus can be detected in both feces and water in which the birds swim. This provides a means of virus spread to new avian hosts and potentially to poultry or other livestock. Analysis of both water and fecal material from waterfowl habitat can provide evidence of avian influenza circulating in wild bird populations. In 2006, USDA and others plan to collect 50,000 samples from high-risk waterfowl habitats across the United States.

BENEFITS OF MONITORING DATA

In addition to providing an early warning system for disease occurrence in U.S. wild birds and domestic poultry, the monitoring data will be used to create a national database that incorporates and tracks all avian influenza data collected from wild birds in the United States. The database will be available to all agencies, organizations and policymakers involved in avian influenza monitoring and response. The data collected in this system will be used by scientists to develop a better understanding of the movement of avian influenza viruses among wild and domestic animals, improve risk analyses and target monitoring strategies to track regarding future avian influenza spread.

Additional information

For more information about avian influenza:
www.usda.gov/birdflu
www.nwhc.usgs.gov/research/avian_influenza/avian_influenza.html
www.pandemicflu.gov