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CDC HEALTH ADVISORY

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Highly Pathogenic Avian Influenza A(H5N1) Virus: Recommendations for Human Health Investigations and Response

Summary

A person has tested positive for avian influenza A(H5) virus (H5 bird flu) in the U.S., as confirmed by the Centers for Disease Control and Prevention (CDC) and reported by the Colorado Department of Public Health and Environment on April 28, 2022. This case occurred in a person who had direct exposure to poultry and who was involved in the culling (depopulating) of poultry with presumptive H5N1 bird flu.

Starting in January, the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) detected highly pathogenic avian influenza (HPAI) A(H5N1) virus in wild birds in the United States followed by multiple detections in U.S. commercial poultry and backyard bird flocks [1,2]. Detection of A(H5) virus in one person who was involved in culling of poultry does not change the human health risk assessment, which remains low for the general public. People with work or recreational exposures to infected birds are at greater risk of infection and should follow recommended precautions. The purpose of this HAN Health Advisory is to notify public health workers, clinicians, and the public of the potential for human infection with this virus and to describe the CDC's recommendations for patient investigation and testing, infection control including the use of personal protective equipment, and antiviral treatment and prophylaxis.

Background

During January 13, 2022, through April 27, 2022, USDA APHIS reported more than 899 detections of wild birds infected with HPAI A(H5N1) virus in 33 states [1]. On February 9, 2022, USDA APHIS confirmed the first outbreak of HPAI A(H5N1) virus in a commercial turkey flock in Indiana [2]. Since then, APHIS has identified 247 HPAI A(H5N1) outbreaks among commercial poultry or backyard bird flocks in 29 states involving more than 35 million birds.

On April 20, 2022, an adult in Colorado developed fatigue following exposure to presumptive H5N1 virus-infected poultry while participating in poultry depopulation activities during April 18-22, 2022. The individual, who does not have any known chronic medical conditions, reported wearing recommended personal protective equipment although compliance with recommended eye protection was unclear. An upper respiratory tract specimen was collected from the individual on April 20, 2022. The specimen arrived at and was tested at the Colorado Department of Public Health and Environment Laboratory Services on April 25, 2022; reverse transcription-polymerase chain reaction (RT-PCR) analysis indicated it was positive for influenza A virus but negative for contemporary seasonal human H1pdm09 and H3 influenza A virus subtypes. The specimen was forwarded to the Influenza Division of the Centers for Disease Control and Prevention (CDC) for further testing, was received at CDC on April 27, 2022, and confirmed as influenza A(H5) virus using RT-PCR the same day. The A(H5)-positive individual did not report any other symptoms and their fatigue resolved after 3 days; the individual returned to their baseline health. The individual remains asymptomatic in isolation on oseltamivir treatment. A second respiratory specimen from the same patient was collected on April 26, 2022, and tested negative for influenza viruses on April 27, 2022, by the Colorado Department of Public Health and Environment Laboratory Services. Whether the detection of H5 virus in the original respiratory specimen is a result of transient

surface contamination of the individual's nasal passages or represents infection, cannot be determined at this point. Public Health Authorities are pursuing the appropriate public health response and are assuming this is an infection and taking actions to contain and treat. Specimens from close contacts of the A(H5)-positive individual and persons who participated in depopulation activities at the same facility were collected on April 20, 2022, and tested negative for influenza viruses. These individuals are being monitored for symptoms and additional respiratory specimens are being obtained and re-tested for influenza viruses. All individuals who were exposed to poultry at this facility are being monitored for symptoms for 10 days and will be tested if symptomatic in accordance with CDC and USDA guidance.

Ancestors of HPAI A(H5N1) viruses first emerged in southern China and led to large poultry outbreaks in Hong Kong in 1997, which resulted in 18 human infections. These poultry outbreaks were controlled, but HPAI A(H5N1) viruses were not eradicated in birds, and the virus reassorted and reemerged in 2003 to spread widely in birds throughout Asia, and later in Africa, Europe, and the Middle East, causing sporadic human infections. HPAI A(H5) viruses were detected in North America from 2014 to 2016 where they caused widespread poultry outbreaks and detections among wild birds in Canada and the United States.

Since 2003, 19 countries have reported 864 human infections and 456 deaths with HPAI A(H5N1) virus to the [World Health Organization](#) (WHO) as of March 1, 2022 [3]. However, contemporary HPAI A(H5) viruses circulating globally and causing outbreaks in U.S. wild birds and poultry are different from earlier HPAI A(H5N1) viruses. Prior to the human case of A(H5) virus in the United States reported here, the only other human infection with this HPAI A(H5N1) virus was an asymptomatic case reported in the United Kingdom in January 2022 in association with exposure to domestically kept infected ducks. The case reported by Colorado is the first human detection of any influenza A(H5) virus in the United States. At this time, there is no evidence of sustained human-to-human transmission of HPAI A(H5N1) virus in the U.S.

Influenza A viruses infect the respiratory and gastrointestinal tracts of birds causing birds to shed the virus in their saliva, mucous, and feces. Human infections with avian influenza A viruses can happen when enough virus gets into a person's eyes, nose, or mouth or is inhaled. People with close or prolonged unprotected contact with infected birds or contaminated environments are at greater risk of infection. Illnesses in humans from avian influenza A virus infections have ranged from mild (e.g., eye infection, upper respiratory symptoms) to severe illness (e.g., pneumonia) resulting in death. The spread of avian influenza A viruses from one infected person to another has been reported in other countries, but is very rare, and when it has happened, it has not led to sustained spread among people.

At this time, CDC considers the human health risk to the U.S. public from these newly identified HPAI A(H5N1) viruses to be low; however, people with close or prolonged, unprotected contact with infected birds or contaminated environments are at greater risk of infection. While there is little information about the spectrum of illness that could result from human infections with current H5N1 bird flu viruses, currently, CDC considers this virus as having the potential to cause severe disease in humans and recommends the following:

Recommendations for Clinicians

Clinicians should consider the possibility of HPAI A(H5N1) virus infection in persons showing signs or symptoms of respiratory illness who have relevant exposure history. This includes persons who have had contact with potentially infected birds (e.g., handling, slaughtering, defeathering, butchering, culling, preparation for consumption); direct contact with water or surfaces contaminated with feces or parts (carcasses, internal organs, etc.) of potentially infected birds; and persons who have had prolonged exposure to potentially infected birds in a confined space. Clinicians should contact the state public health department to arrange testing for influenza A(H5N1) virus, collect respiratory specimens using personal protective equipment (PPE), consider starting empiric antiviral treatment (see below), and encourage the patient to isolate at home away from their household members and not go to work or school until it is determined they do not have avian influenza A virus infection. [Testing for other potential](#)

[causes of acute respiratory illness](#) should also be considered depending upon the local epidemiology of circulating respiratory viruses, including SARS-CoV-2.

Recommendations for State Health Departments

State health departments should investigate potential human cases of HPAI A(H5N1) virus infection as described below and should notify CDC within 24 hours of identifying a case under investigation. Rapid detection and characterization of novel influenza A viruses in humans remain critical components of national efforts to prevent further cases, to allow for evaluation of clinical illness associated with them, and to assess the ability of these viruses to spread from human to human.

Recommendations for Surveillance and Testing

People exposed to HPAI A(H5N1)-infected birds (including people wearing recommended PPE) should be monitored for signs and symptoms of influenza beginning after their first exposure and for 10 days after their last exposure.

Patients who meet Epidemiologic criteria AND either Clinical OR Public Health Response criteria below should be [tested for HPAI A\(H5N1\) virus infection](#) by reverse-transcription polymerase chain reaction (RT-PCR) assay using H5-specific primers and probes at your state or local public health department.

Epidemiological Criteria

Persons with recent exposure (within 10 days) to HPAI A(H5N1) virus through one of the following:

- Exposure to HPAI A(H5N1) virus infected birds defined as follows:
 - Close exposure (within six feet) to birds, with confirmed avian influenza A virus infection by A(H5N1) virus. Bird exposures can include, but are not limited to handling, slaughtering, defeathering, butchering, culling, or preparing birds for consumption, OR
 - Direct contact with surfaces contaminated with feces or bird parts (e.g., carcasses, internal organs) from infected birds, OR
 - Visiting a live poultry market with confirmed bird infections or associated with a case of human infection with HPAI A(H5N1).
- Exposure to an infected person - close (within six feet) unprotected (without use of respiratory and eye protection) exposure to a person who is a confirmed, probable, or symptomatic suspected case of human infection with HPAI A(H5N1) (e.g., in a household or healthcare facility).
- Laboratory exposure (unprotected exposure to HPAI A(H5N1) virus in a laboratory)

Clinical Criteria

Persons with signs and symptoms consistent with acute or lower respiratory tract infection, or with conjunctivitis, or complications of acute respiratory illness without an identified cause.

Examples include but are not limited to:

- Mild illness (e.g., cough, sore throat, fever or feeling feverish, rhinorrhea, fatigue, myalgia, arthralgia, headache) or conjunctivitis (red eye, discharge from eye)
- Moderate to severe illness: (e.g., shortness of breath or difficulty breathing, altered mental status, seizures)
- Complications: pneumonia, respiratory failure, acute respiratory distress syndrome, multi-organ failure, meningoencephalitis

Public Health Response Criteria

Asymptomatic persons whom public health authorities, in consultation with CDC, determine need to be tested to assess the clinical spectrum of infection with HPAI A(H5N1) virus as part of public health investigations.

Preferred Respiratory Specimens

For persons with suspected HPAI A(H5N1) virus infection, [the following specimens](#) should be collected as soon as possible after illness onset or when deemed necessary: a nasopharyngeal swab and a nasal aspirate or wash, or two swabs combined into one viral transport media vial (e.g., a nasal or nasopharyngeal swab combined with an oropharyngeal swab). If these specimens cannot be collected, a single nasal or oropharyngeal swab is acceptable. Patients with severe respiratory disease also should have lower respiratory tract specimens (e.g., an endotracheal aspirate or bronchoalveolar lavage fluid) collected, if possible.

For severely ill persons, multiple respiratory tract specimens from different sites should be obtained to increase the potential for HPAI A(H5N1) virus detection.

Recommendations for the Public

People should avoid unprotected exposure to sick or dead birds, bird feces, litter, or materials contaminated by birds with suspected or confirmed HPAI A(H5N1) virus infection. Personal protective equipment (PPE) includes a properly fitted unvented or indirectly vented safety goggles, disposable gloves, boots or boot covers, a NIOSH-approved respirator (e.g., N95), disposable fluid-resistant coveralls, and disposable head cover or hair cover. [PPE should be worn](#) when in direct or close contact (within about six feet) with sick or dead poultry, poultry feces, litter, or materials potentially contaminated with HPAI A(H5N1) virus.

People exposed to HPAI A(H5N1)-virus infected birds (including people wearing recommended PPE) should monitor for signs and symptoms of influenza beginning after their first exposure and for 10 days after their last exposure. Influenza antiviral prophylaxis may be considered to prevent infection, particularly in those who had unprotected exposure to HPAI A(H5N1)-virus infected birds (see below). Persons who develop respiratory illness after exposure to HPAI A(H5N1) virus infected birds should seek prompt medical evaluation for influenza testing and antiviral treatment by their clinician or public health department. Symptomatic persons should isolate away from household members and others except for seeking medical evaluation.

Recommendations for Flock Owners and Worker Protection

To reduce risk of HPAI A(H5N1) virus infection, backyard bird flock owners, poultry workers and responders should avoid unprotected direct physical contact with sick or dead birds, carcasses, feces, or litter from potentially infected poultry. [Poultry workers should wear recommended PPE](#) when in direct contact with sick or dead birds, carcasses, feces, or litter from potentially infected poultry, and when going into any buildings with sick or dead poultry, carcasses, feces, or litter from potentially infected poultry.

[Workers should receive training](#) on and demonstrate an understanding of when to use PPE; what PPE is necessary; how to properly put on, use, take off, dispose of, and maintain PPE; and PPE limitations. Backyard bird flock owners should take similar precautions using commercially available N95 respirators, eye protection, and gloves, and perform thorough hand washing after contact.

Recommendations for Infection Control

Standard, contact, and airborne precautions are recommended for patients presenting for medical care or evaluation who have illness consistent with influenza and recent exposure to potentially infected birds. For additional guidance on infection control precautions for patients who might be infected with HPAI A(H5N1) virus, please refer to [guidance for infections with novel influenza A viruses associated with severe disease](#).

Recommendations for Influenza Antiviral Treatment and Chemoprophylaxis

Chemoprophylaxis of Persons with Bird Exposure: Chemoprophylaxis with influenza antiviral medications can be considered for any person meeting exposure criteria. Decisions to initiate post-exposure antiviral chemoprophylaxis should be based on clinical judgment, with

consideration given to the type of exposure, duration of exposure, time since exposure, known infection status of the birds the person was exposed to, and to whether the exposed person is at higher risk for complications from seasonal influenza (<https://www.cdc.gov/flu/avianflu/guidance-exposed-persons.htm>).

Chemoprophylaxis is not routinely recommended for personnel who used proper PPE while handling sick or potentially infected birds or decontaminating infected environments (including animal disposal).

If antiviral chemoprophylaxis is initiated, treatment dosing for the neuraminidase inhibitors oseltamivir or zanamivir (one dose twice daily) is recommended instead of the typical antiviral chemoprophylaxis regimen. For specific dosage recommendations for treatment by age group, please see [Influenza Antiviral Medications: Summary for Clinicians](#). Physicians should consult the manufacturer's package insert for dosing, limitations of populations studied, contraindications, and adverse effects. If exposure was time-limited and not ongoing, five days of medication (one dose twice daily) from the last known exposure is recommended.

Treating Symptomatic Persons with Bird Exposure

Outpatients meeting bird exposure criteria who develop signs and symptoms compatible with influenza should be referred for prompt medical evaluation and empiric initiation of influenza antiviral treatment with a neuraminidase inhibitor, oseltamivir or zanamivir, or the cap-dependent endonuclease inhibitor, baloxavir, as soon as possible. Clinical benefit is greatest when antiviral treatment is administered early, especially within 48 hours of illness onset.

Hospitalized patients who are confirmed, probable, or suspected cases of human infection with HPAI A(H5N1) virus, regardless of time since illness onset are recommended to initiate antiviral treatment with oral or enterically administered oseltamivir as soon as possible. Antiviral treatment should not be delayed while waiting for laboratory testing results.

For detailed guidance on dosing and treatment duration, please see [Interim Guidance of the Use of Antiviral Medications for the Treatment of Human Infection with Novel Influenza A Viruses Associated with Severe Human Disease](#) (<http://www.cdc.gov/flu/avianflu/novel-av-treatment-guidance.htm>).

Monitoring and Chemoprophylaxis of Close Contacts of Persons with HPAI A(H5N1) virus infection: Recommendations for monitoring and chemoprophylaxis of close contacts of infected persons are different than those that apply to persons who meet bird exposure criteria. Post-exposure prophylaxis of close contacts of a person with HPAI A(H5N1) virus infection is recommended with oseltamivir twice daily (treatment dosing) instead of the once daily pre-exposure prophylaxis dosing. For detailed guidance, please see [Interim Guidance on Follow-up of Close Contacts of Persons Infected with Novel Influenza A Viruses and Use of Antiviral Medications for Chemoprophylaxis](#).

Vaccination

No human vaccines for HPAI A(H5N1) are currently available in the United States. Seasonal influenza vaccines do not provide any protection against human infection with HPAI A(H5N1) viruses.

For More Information

- [General information about avian influenza viruses and how they spread](#)
- [Past Outbreaks of Avian Influenza in North America](#)
- [Transmission of Avian Influenza A Viruses Between Animals and People](#)

- [H5 Viruses in the United States](#)
- [General information about Avian Influenza viruses in birds](#)
- [Avian Influenza: Information for Health Professionals and Laboratorians](#)
- [Reported Human Infections with Avian Influenza A Viruses](#)
- [Guidance on Testing and Specimen Collection for Patients with Suspected Infection with Novel Influenza A Viruses with the Potential to Cause Severe Disease in Humans](#)
- [Recommendations for Worker Protection and Use of Personal Protective Equipment \(PPE\) to Reduce Exposure to Novel Influenza A Viruses Associated with Severe Disease in Humans](#)

References

1. United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS). (2022, January 14). *USDA Confirms Highly Pathogenic Avian Influenza in a Wild Bird in South Carolina*. United States Department of Agriculture. Retrieved April 20, 2022, from https://www.aphis.usda.gov/aphis/newsroom/stakeholder-info/sa_by_date/sa-2022/hpai-sc
2. United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS). (2022, February 9). *USDA APHIS | USDA Confirms Highly Pathogenic Avian Influenza in a Commercial Turkey Flock in Dubois County, Indiana*. United States Department of Agriculture. Retrieved April 22, 2022, from https://www.aphis.usda.gov/aphis/newsroom/stakeholder-info/sa_by_date/sa-2022/hpai-indiana
3. World Health Organization. (2021, April 15). *Cumulative number of confirmed human cases for avian influenza A(H5N1) reported to WHO, 2003–2021, 15 April 2021*. Retrieved April 22, 2022, from [https://www.who.int/publications/m/item/cumulative-number-of-confirmed-human-cases-for-avian-influenza-a\(h5n1\)-reported-to-who-2003-2021-15-april-2021](https://www.who.int/publications/m/item/cumulative-number-of-confirmed-human-cases-for-avian-influenza-a(h5n1)-reported-to-who-2003-2021-15-april-2021)

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