Disease Outbreak News

Avian Influenza A(H5N1) - United States of America

9 April 2024

See all DONs related to this event

Situation at a glance

The World Health Organization (WHO) was notified about a laboratory-confirmed case of human infection with an influenza A(H5N1) virus on 1 April 2024 by the United States of America IHR National Focal Point (NFP). The patient developed symptoms on 27 March and had a history of exposure to dairy cattle (cows) presumed to be infected with influenza A (H5N1) virus. This is the second confirmed human case of influenza A(H5N1) detected in the country. It also appears to be the first human infection with A(H5N1) acquired from contact with an infected mammal, although human infections with other influenza subtypes have previously been acquired from mammals. No additional associated cases of human infection with influenza A(H5N1) have been identified. Since the virus has not acquired mutations that facilitate transmission among humans and based on available information, WHO assesses the public health risk to the general population posed by this virus to be low and for occupationally exposed persons, the risk of infection is considered low-to-moderate.

Description of the situation

On 1 April 2024, the IHR NFP of the United States of America notified WHO of a laboratory-confirmed human case of avian influenza A(H5N1) detected in the state of Texas.

The case is aged over 18 years. On 27 March, the case developed conjunctivitis, was reported to be while working at a commercial dairy cattle farm and had a history of exposure to dairy cattle (cows) presumed to be infected with influenza A(H5N1) virus *(1)*.

On 28 March, respiratory and conjunctival specimens were collected from the case and tested at the Texas Tech University Bioterrorism Response Laboratory. Reverse transcription-polymerase chain reaction (RT-PCR) analysis indicated that both specimens were presumptive positive for influenza A(H5) virus. The specimens were then sent to the United States Centers for Disease Control and Prevention (US CDC) for further testing. They were received and tested at the US CDC on 30 March and confirmed as high pathogenicity avian influenza (HPAI) A(H5N1) virus clade 2.3.4.4b by RT-PCR and sequencing *(1) (2)*. Genome sequencing of the virus didn't show new mutations possibly associated with increased transmission to humans.

On 28 March, the patient was advised to isolate and given antiviral treatment (oseltamivir) following US CDC guidance. The patient did not report symptoms other than conjunctivitis, was not hospitalized, and at the time of reporting, was recovering *(1)*.

Household contacts of the patient have not reported illness and have been provided influenza antiviral prophylaxis as per US CDC recommendations. No additional cases of human infection with influenza A(H5N1) associated with this case have been identified *(1)*.

In the United States, since January 2022, detections of HPAI A(H5N1) virus among wild birds have been reported in 50 states or territories. There have been reports of sporadic A-(H5) virus outbreaks among poultry and backyard flocks as well as sporadic detections in mammals and outdoor cats on the dairy facilities as reported by the United States Department of Agriculture (USDA) Animal Plant Health Inspection Service (APHIS).

Influenza A virus infection is exceptionally rare in bovine species *(3)*. This human case had exposure to dairy cattle in Texas, presumed to be infected with HPAI A(H5N1) virus *(4)(5)*. On 25 March, the USDA reported the first detection of HPAI A(H5N1) virus in dairy cattle and unpasteurized milk samples from cattle in Texas and Kansas in four dairy herds. On 29 March, USDA announced confirmation of additional detections in dairy cattle in Michigan dairy cattle that recently received cows from Texas. USDA has also announced additional confirmed detections in dairy cattle in Idaho, New Mexico, and Ohio. To date, USDA has announced confirmed detections on 15 farms across six states: Idaho (n=1), Kansas (n=3), Michigan (n=1), New Mexico (n=2), Ohio (n=1), and Texas (n=7) *(5,6,7)*. USDA is continuing to monitor and test samples collected from other farms where cattle are displaying decreased lactation, low appetite, and other signs *(1,5,6,7)*.

The USDA has publicly posted the genetic sequences of several recently detected HPAI A(H5N1) viruses found in US wild birds, poultry, wild mammals and cattle in Texas *(8)*. The viruses are from clade 2.3.4.4b, which is the most common HPAI A(H5N1) virus circulating among birds worldwide currently. CDC has publicly posted the genome of the virus identified from the patient in Texas and identified only minor changes when compared to the animal viruses *(2)*. Between 9 February 2022 to 29 March 2024, more than 8000 people were actively monitored in the United States following exposure to animals presumed to be infected with HPAI A(H5N1) viruses.

Epidemiology

Animal influenza A viruses normally circulate in animals but can also infect humans. Infections in humans have primarily been acquired through direct contact with infected animals or contaminated environments. Depending on the original host, influenza A viruses can be classified as avian influenza, swine influenza, or other types of animal influenza viruses.

Avian influenza virus infections in humans may cause diseases ranging from mild upper respiratory tract infection to more severe diseases and can be fatal. Conjunctivitis, gastrointestinal symptoms, encephalitis and encephalopathy have also been reported in previous human infections with A (H5N1) viruses. There have also been a few detections of A(H5N1) virus in asymptomatic persons who had exposure to infected birds.

Laboratory tests are required to diagnose human infection with influenza. WHO periodically updates technical guidance protocols for the detection of zoonotic influenza using molecular methods, e.g. RT-PCR. Evidence suggests that some antiviral drugs, notably neuraminidase inhibitors (oseltamivir, zanamivir), can reduce the duration of viral replication and improve prospects of survival in some cases.

Avian influenza A(H5N1) virus belonging to Gs/GD lineage, clade 2.3.4.4b Eurasian-origin infections have been reported in birds in the United States since 2022. In late March 2024, HPAI A(H5N1) was also detected in dairy herds in Texas and Kansas *(4,5)*.

This is the first human infection caused by avian influenza A(H5N1) virus in 2024 in the United States and the second confirmed detection in human in the country. This also appears to be the first human infection with A(H5N1) acquired from contact with an infected mammal although human infections with other influenza subtypes have been acquired from mammals. The first detection of influenza A(H5N1) in human in the United States was identified in April 2022, in a person involved in culling birds at a commercial poultry facility in Colorado *(9)*.

In the past, small clusters of A(H5) virus infections were reported, including some involving health care workers, where limited human-to-human transmission could not be excluded; however, sustained human-to-human transmission has not been detected. In this event, the case had direct contact with cows presumed to be infected with A(H5N1) viruses and no further human cases have been detected associated with this event.

Public health response

Local and national health authorities implemented the following public health measures *(1,10)*:

- Public health officials are conducting surveillance activities in Texas in response to this detection.
- US CDC is working with state health departments to monitor workers who may have been in contact with infected or potentially infected birds/animals and test those people who develop symptoms.
- US CDC has issued recommendations for the public regarding avoiding unprotected contact with sick or dead animals, including wild birds, poultry, other domestic fowl, and other wild or domestic animals, as well as animal droppings, litter, or materials contaminated by birds or other animals with suspected or confirmed HPAI A (H5N1) virus infection.
- US CDC has issues recommendations to avoid consumption of raw or undercooked food or related uncooked food products, such as unpasteurized (raw) milk or raw cheese, from animals with suspected or confirmed infection with HPAI A(H5N1) virus.

The United States has a robust surveillance system that is designed to mitigate the spread of animal diseases, thereby protecting public health, and maintaining a safe food supply for domestic and international markets. The U.S. surveillance system includes a national network of border protection personnel at ports of entry *(1)*.

WHO risk assessment

This human case was reportedly exposed to dairy cattle in Texas, where HPAI A (H5N1) has recently been confirmed in dairy herds.

From 2003 to 1 April 2024, a total of 889 cases and 463 deaths (CFR 52%) caused by influenza A(H5N1) virus have been reported worldwide from 23 countries. The most recently reported case in humans prior to the current case, was in March 2024 in Viet Nam *(11)*. The human case in Texas is the fourth reported in the region of the Americas, the most recent prior case having been reported in Chile in March 2023 *(12)*.

Whenever avian influenza viruses are circulating in birds, there is a risk for sporadic infections in mammals and humans due to exposure to infected animals (including livestock), or contaminated environments and thus, further human cases are not unexpected. Influenza A infection has been rarely reported in bovine species and spread among dairy cattle herds in four U.S. States is being assessed. Previously, there have been human infections with other avian influenza subtypes following exposure to infected mammals.

Since the virus has not acquired mutations that facilitate transmission among humans and based on available information, WHO assesses the public health risk to the general population posed by this virus to be low and for occupationally exposed persons the risk of infection is considered low-to-moderate.

There are no specific vaccines for preventing influenza A(H5N1) virus infection in humans. Candidate vaccines to prevent H5 infection in humans have been developed for pandemic preparedness purposes. Close analysis of the epidemiological situation, further characterization of the most recent viruses (from human cases and animal) and comprehensive investigations around human cases are critical to assess associated risk and to adjust risk management measures in a timely manner.

If needed, the risk assessment will be reviewed should further epidemiological or virological information become available.

WHO advice

This case does not change the current WHO recommendations on public health measures and surveillance of influenza. Establishing and monitoring the extent of influenza A(H5N1) virus in dairy herds in the affected localities of the country should inform changes in the ongoing risk assessment.

Due to the constantly evolving nature of influenza viruses, WHO continues to stress the importance of global surveillance to detect and monitor virological, epidemiological and clinical changes associated with emerging or circulating influenza viruses that may affect human (or animal) health and timely virus sharing for risk assessment.

When there has been human exposure to a known outbreak of an influenza A virus in or when there has been an identified human case of infection with such a virus, enhanced surveillance in potentially exposed human populations becomes necessary. Enhanced surveillance should consider the health care seeking behaviour of the population, and could include a range of active and passive health care and/or community-based approaches, including: enhanced surveillance in local influenza-like illness (ILI)/severe acute respiratory infection (SARI) systems, active screening in hospitals and of groups that may be at higher occupational risk of exposure, and inclusion of other sources such as traditional healers, private practitioners and private diagnostic laboratories.

In the case of a confirmed or suspected human infection caused by a novel influenza A virus with pandemic potential, including avian influenza virus, a thorough epidemiologic investigation (even while awaiting the confirmatory laboratory results) of history of exposure to animals, of travel, and contact tracing should be conducted. The epidemiologic investigation should include early identification of unusual events that could signal person-to-person transmission of the novel virus and clinical samples collected from the time and place that the case occurred should be tested and sent to a WHO Collaboration Center for further characterization.

Travelers to countries with known outbreaks of animal influenza should avoid farms, contact with animals in live animal markets, entering areas where animals may be slaughtered, or contact with any surfaces that appear to be contaminated with animal feces. Travelers should also wash their hands often with soap and water. Travelers should follow good food safety and good food hygiene practices. Should infected individuals from affected areas travel internationally, their infection may be detected in another country during travel or after arrival. If this were to occur, further community-level spread is considered unlikely as this virus has not acquired the ability to transmit easily among humans.

All human infections caused by a novel influenza A virus subtype are notifiable under the International Health Regulations (IHR) and State Parties to the IHR (2005) are required to immediately notify WHO of any laboratory-confirmed case of a recent human infection caused by an influenza A virus with the potential to cause a pandemic. Evidence of illness is not required for this report.

WHO does not advise special traveler screening at points of entry or restrictions regarding the current situation of influenza viruses at the human-animal interface.

Further information

1. United States of America International Health Regulations National Focal Point. Email communication dated 2 April 2024. Washington D.C.; 2024. Unpublished.
2. Centers for Disease Control and Prevention. Technical Update: Summary Analysis of Genetic Sequences of Highly Pathogenic Avian Influenza A(H5N1) Viruses in Texas: CDC-US: 2024. Available from: https://www.cdc.gov/flu/avianflu/spotlights/2023-2024/h5n1-analysis-texas.htm
3. Sreenivasan CC, Thomas M, Kaushik RS, Wang D, Li F. Influenza A in Bovine Species: A Narrative Literature Review. Viruses. 2019;11(6):561. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6631717/
4. Centers for Disease Control and Prevention. Highly Pathogenic Avian Influenza A (H5N1) Virus Infection Reported in a Person in the U.S. Atlanta: CDC-US: 2024. Available from: https://www.cdc.gov/media/releases/2024/p0401-avian-flu.html
5. United States Department of Agriculture, Animal and Plant Health Inspection Service. Federal and State Veterinary, Public Health Agencies Share Update on HPAI Detection in Kansas, Texas Dairy Herds. Washington, D.C.: USDA; 2024. Available from: https://www.aphis.usda.gov/news/agency-announcements/federal-state-veterinary-public-health-agencies-share-update-hpai
6. United States Department of Agriculture, Animal and Plant Health Inspection Service. USDA, FDA and CDC Share Update on HPAI Detections in Dairy Cattle. Washington, D.C.: USDA; 2024. Available from: https://www.aphis.usda.gov/news/agency-announcements/usda-fda-cdc-share-update-hpai-detections-dairy-cattle
7. United States Department of Agriculture, Animal and Plant Health Inspection Service. Highly Pathogenic Avian Influenza (HPAI) Detections in Livestock. Washington, D.C.: USDA; 2024. Available from: https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/livestock
8. United States Department of Agriculture, Animal and Plant Health Inspection Service. Detection of Highly Pathogenic Avian Influenza. Washington, D.C.: USDA; 2024. Available from: https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections
9. World Health Organization. Disease Outbreak News; Avian Influenza A (H5N1) – the United States of America. Geneva: WHO; 2022. Available from: https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON379
10. Centers for Disease Control and Prevention. Highly Pathogenic Avian Influenza A(H5N1) Virus in Animals: Interim Recommendations for Prevention, Monitoring, and Public Health Investigations: CDC-US: 2024. Available from: https://www.cdc.gov/flu/avianflu/hpai/hpai-interim-recommendations.html
11. World Health Organization. Cumulative number of confirmed human cases of avian influenza A(H5N1) reported to WHO. Geneva: WHO; 2024. Available from: https://www.who.int/publications/m/item/cumulative-number-of-confirmed-human-cases-for-avian-influenza-a(h5n1)-reported-to-who--2003-2024-26-february-2024
12. Pan American Health Organization / World Health Organization. Epidemiological Update Outbreaks of avian influenza caused by influenza A(H5N1) in the Region of the Americas, 18 May 2023. Washington, D.C.: PAHO/WHO; 2023. Available from: https://www.paho.org/en/documents/epidemiological-update-outbreaks-avian-influenza-caused-influenza-ah5n1-region-americas

Further information

- PAHO/WHO. Influenza at the Human-Animal Interface: PAHO Recommendations to Strengthen Intersectoral Work for Surveillance, Early Detection, and Investigation, 9 July 2020.
- Current technical information including monthly risk assessments at the Human-Animal Interface.
- US CDC. Influenza Type A Viruses.
- WHO. Zoonotic Influenza Outbreak Toolbox.
- WHO. International Health Regulations (2005).
- WHO. Manual for the laboratory diagnosis and virological surveillance of influenza (2011).
- Terms of Reference for National Influenza Centers of the Global Influenza Surveillance and Response System.
- U.S. CDC. Case of Human Avian Influenza A(H5) Virus Reported.
- U.S. CDC. Intercontinental Movement of Highly Pathogenic Avian Influenza A(H5N1) Clade 2.3.4.4 Virus to the United States, 2021.
- Pan American Health Organization / World Health Organization. Epidemiological Update Outbreaks of avian influenza caused by influenza A(H5N1) in the Region of the Americas - 20 March 2024. Washington, DC: PAHO/WHO; 2024.
- Pan American Health Organization / World Health Organization. Risk Assessment for public health related to outbreaks caused by Highly Pathogenic Avian Influenza (HPAI) A(H5N1), clade 2.3.4.4b, in animal species in the Region of the Americas - 20 September 2023. Washington, D.C.: PAHO/WHO; 2023.
- Pan American Health Organization / World Health Organization. Strengthening the intersectoral work for Influenza at the Human Animal Interface in the Region of the Americas: Technical Questions and Answers. Washington, D.C.: PAHO/WHO; 2023.
- Pan American Health Organization / World Health Organization. Report of the Regional Consultation for the Strengthening of Intersectoral Work in the Human-Animal Interface of Influenza. Washington, DC: PAHO/WHO; 2023
- Pan American Health Organization / World Health Organization. Call to action to establish the Intersectoral Commission for the Prevention and Control of Zoonotic Influenza in the Americas.

Citable reference: World Health Organization (9 April 2024). Disease Outbreak News; Avian Influenza A (H5N1) – the United States of America. Available at: http://www.who.int/emergencies/disease-outbreak-news/iten/2024-DON512

This report was revised on 10 April 2024 to clarify the source of the human infection.