Influenza at the human-animal interface

Summary and risk assessment, from 6 November to 19 December 2025[1]

- **New human cases1[2]:** From 6 November to 19 December 2025, based on reporting date, the detection of influenza A(H5N1) in one human, A(H5N5) in one human, A(H9N2) in seven humans, and an influenza A(H1N1) variant virus in one human were reported officially. In addition, one human case of infection with an influenza A(H1N2) variant virus was detected.
- **Circulation of influenza viruses with zoonotic potential in animals:** High pathogenicity avian influenza (HPAI) events in poultry and non-poultry animal species continue to be reported to the World Organisation for Animal Health (WOAH).[3] The Food and Agriculture Organization of the United Nations (FAO) also provides a global update on avian influenza viruses with pandemic potential.[4] Additionally, low pathogenicity avian influenza viruses as well as swine influenza viruses continue to circulate in animal populations.
- **Risk assessment[5]:** Sustained human to human transmission has not been reported associated with the above-mentioned human infection events. Based on information available at the time of this risk assessment update, the overall public health risk from currently known influenza A viruses detected at the human-animal interface has not changed and remains low. The occurrence of sustained human-to-human transmission of these viruses is currently considered unlikely. Although human infections with viruses of animal origin are infrequent, they are not unexpected at the human-animal interface.
- **IHR compliance[6]:** This includes any influenza A virus that has demonstrated the capacity to infect a human and its haemagglutinin (HA) gene (or protein) is not a mutated form of those, i.e. A(H1) or A(H3), circulating widely in the human population. Information from these notifications is critical to inform risk assessments for influenza at the human-animal interface.

Avian influenza viruses in humans

Current situation:

Since the last risk assessment of 5 November 2025, one laboratory-confirmed human case of A(H5N1) infection was detected in Cambodia, and one laboratory-confirmed human case of A(H5N5) virus infection was detected in the United States of America.

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[1] This summary and assessment covers information confirmed during this period and may include information received outside of this period.

[2] For epidemiological and virological features of human infections with animal influenza viruses not reported in this assessment, see the reports on human cases of influenza at the human-animal interface published in the Weekly Epidemiological Record here.

[3] World Organisation for Animal Health (WOAH). Avian influenza. Global situation. Available at: https://www.woah.org/en/disease/avian-influenza/#ui-id-2.

[4] Food and Agriculture Organization of the United Nations (FAO). Global Avian Influenza Viruses with Zoonotic Potential situation update. Available at: https://www.fao.org/animal-health/situation-updates/global-aiv-with-zoonotic-potential.

[5] World Health Organization (2012). Rapid risk assessment of acute public health events. World Health Organization. Available at: https://iris.who.int/handle/10665/70810.

[6] World Health Organization. Case definitions for the 4 diseases requiring notification to WHO in all circumstances under the International Health Regulations (2005). Case definitions for the four diseases requiring notification in all circumstances under the International Health Regulations (2005).

A(H5N1), Cambodia

On 16 November 2025, Cambodia notified WHO of a confirmed human infection with avian influenza A(H5N1) in a 22-year-old male from Phnom Penh. The case developed symptoms on 10 November 2025, sought medical care at a clinic, and was diagnosed with pneumonia. He was subsequently admitted to the national hospital in Phnom Penh on 13 November. Samples were collected on the same day and tested positive for avian influenza A(H5N1) on 15 November. His condition deteriorated rapidly, and he died the same day.

Investigations conducted in the case's hometown in Kampong Cham Province, which he visited between 4 and 6 November, revealed that the case had apparently healthy domestic birds (chickens and ducks) in his house. However, sick and dead poultry had been reported in the village since 15 October. Samples collected from two ducks and one chicken in the village tested positive for influenza A(H5N1). Enhanced public health surveillance was implemented. Among the case's contacts, one was symptomatic, and all contacts tested negative for influenza A(H5N1).

Eighteen human infections with A(H5N1) viruses have been confirmed in Cambodia in 2025 and nine of these have been fatal. All these cases in 2025 had exposure to domestic birds or their environments. In some cases, domestic birds were reported to be sick or dead. Where the information is available, the genetic sequence data from the viruses from the human cases closely matches that from recent local animal viruses and are identified as clade 2.3.2.1e viruses. From the information available thus far on these recent human cases, there is no indication of human-to-human transmission of the A(H5N1) viruses.

A(H5N5), United States of America

On 15 November 2025, the United States of America (US) notified WHO of a confirmed human infection with influenza A(H5). The patient was an adult with underlying medical conditions residing in Washington State. The patient developed symptoms including fever during the week ending 25 October 2025. During the week ending 8 November 2025, the patient was hospitalized with a serious illness and subsequently died on 21 November.

Respiratory specimens collected at the healthcare facility tested positive for influenza A virus by reverse-transcription-polymerase chain reaction (RT-PCR) and were presumptive positive for influenza A(H5) at the laboratory at the University of Washington. The specimens were sent to the Washington State Public Health Laboratory, where influenza A(H5) was confirmed with the US Centers for Disease Control and Prevention (CDC) influenza A(H5) assay. The sample was received at the CDC on 19 November. Sequencing conducted at the University of Washington and at the CDC indicated this was an influenza A(H5N5) virus belonging to the H5 haemagglutinin (HA) clade 2.3.4.4b.

Public health investigation revealed that the patient kept backyard poultry and domestic birds. Additional epidemiological investigations were under way at the time of notification and included active monitoring of anyone who was in close contact with the patient.[7],[8]

This is the first human case of this subtype reported globally. Human infections with A(H5N1), A(H5N2), A(H5N6) and A(H5N8) have been reported previously. A(H5N5) virus infections in animals

[7] World Health Organization (5 December 2025). Disease Outbreak News; Avian Influenza A(H5N5)- United States of America. Available at: https://www.who.int/emergencies/disease-outbreak-news/item/2025-DON590.

[8] US CDC FluView. Weekly US Influenza Surveillance Report: Key Updates for Week 46, ending November 15, 2025. Available at https://www.cdc.gov/fluview/surveillance/2025-week-46.html.

have been detected and reported. HPAI A(H5) clade 2.3.4.4b A(H5N5) viruses have been detected in North America in wild birds and wild mammals since at least 2023.[9]

According to reports received by WOAH, various influenza A(H5) subtypes continue to be detected in wild and domestic birds in Africa, the Americas, Asia and Europe. Infections in non-human mammals are also reported, including in marine and land mammals.[10] A list of bird and mammalian species affected by HPAI A(H5) viruses is maintained by FAO.[11]

Risk Assessment for avian influenza A(H5) viruses:

1. What is the current global public health risk of additional human cases of infection with avian influenza A(H5) viruses?

Most human infections so far have been reported in people exposed to A(H5) viruses, for example, through contact with infected poultry or contaminated environments, including live poultry markets, and occasionally infected mammals and contaminated environments. As long as the viruses continue to be detected in animals and related environments humans are exposed to, further human cases associated with such exposures are expected but remain unusual. The impact for public health if additional sporadic cases are detected is minimal. The current overall global public health risk of additional sporadic human cases is low.

2. What is the likelihood of sustained human-to-human transmission of avian influenza A(H5) viruses related to the events above?

No sustained human-to-human transmission has been identified associated with the recent reported human infections with avian influenza A(H5) viruses. There has been no reported human-to-human transmission of A(H5N1) viruses since 2007, although there may be gaps in investigations. In 2007 and the years prior, small clusters of A(H5) virus infections in humans were reported, including some involving health care workers, where limited human-to-human transmission could not be excluded; however, sustained human-to-human transmission was not reported.

Current evidence suggests that influenza A(H5) viruses related to these events did not acquire the ability to efficiently transmit between people, therefore sustained human-to-human transmission is thus currently considered unlikely.

3. What is the likelihood of international spread of avian influenza A(H5) viruses by travellers?

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 current evidence suggests these viruses have not acquired the ability to transmit easily among humans.

A(H9N2), China

Since the last risk assessment of 5 November 2025, China notified WHO of four cases of infection with influenza A(H9N2) on 6 November 2025 and three cases on 12 December 2025.

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[9] Erdelyan CNG, Kandeil A, Signore AV, et al. Multiple transatlantic incursions of highly pathogenic avian influenza clade 2.3.4.4b A(H5N5) virus into North America and spillover to mammals. Cell Rep. 2024 Jul 23;43(7):114479. doi:10.1016/j.celrep.2024.114479. Epub 2024 Jul 13. PMID:39003741; PMCID:PMC11305400.

[10] World Organisation for Animal Health (WOAH). Avian influenza. Global situation. Available at: https://www.woah.org/en/disease/avian-influenza/#ui-id-2.

[11] Food and Agriculture Organization of the United Nations. Global Avian Influenza Viruses with Zoonotic Potential situation update. Available at: https://www.fao.org/animal-health/situation-updates/global-aiv-with-zoonotic-potential/bird-species-affected-by-h5nx-hpai/en.

All but two cases were in children. Cases were detected in Guangdong (one), Guangxi (three), Henan (one) and Hubei (two) provinces. The cases had onsets of symptoms in September, October and November 2025. Four cases had reported exposure to backyard poultry, two had exposure to live poultry markets and the source of exposure for one case was under investigation at the time of reporting. All cases had mild illness and recovered, except one in an elderly person with underlying conditions who was hospitalized at the time of reporting with severe pneumonia. No further cases were detected among contacts of these cases. A(H9) viruses were detected in environmental samples collected during the investigations around some of the cases.

Risk Assessment for avian influenza A(H9N2):

1. What is the global public health risk of additional human cases of infection with avian influenza A(H9N2) viruses?

Most human cases follow exposure to the A(H9N2) virus through contact with infected poultry or contaminated environments. Most human infections of A(H9N2) to date have resulted in mild clinical illness. Since the virus is endemic in poultry in multiple countries in Africa and Asia, further human cases associated with exposure to infected poultry are expected but remain unusual. The impact to public health if additional sporadic cases are detected is minimal. The overall global public health risk of additional sporadic human cases is low.

2. What is the likelihood of sustained human-to-human transmission of avian influenza A(H9N2) viruses related to this event?

At the present time, no sustained human-to-human transmission has been identified associated with the recently reported human infections with A(H9N2) viruses. Current evidence suggests that A(H9N2) viruses from these cases did not acquire the ability of sustained transmission among humans, therefore sustained human-to-human transmission is thus currently considered unlikely.

3. What is the likelihood of international spread of avian influenza A(H9N2) virus by travellers?

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 current evidence suggests the A(H9N2) virus subtype has not acquired the ability to transmit easily among humans.

Swine influenza viruses in humans

Influenza A(H1N1)v, China

Since the last risk assessment of 5 November 2025, the detection of a Eurasian avian-like swine influenza A(H1N1)v virus in a human was reported from China on 12 December 2025. A 60-year-old male from Yunnan province had onset of mild illness on 2 November 2025, was hospitalized on 6 November and discharged on 10 November. He had reported exposure to backyard pigs.

Influenza A(H1N2)v, USA

A human case of infection with an influenza A(H1N2)v virus was detected in the state of Vermont in an adult who had an onset of symptoms in early October. The individual was briefly hospitalized and has recovered. The investigation conducted by state public health officials was unable to determine the likely source of exposure or if close contacts developed symptoms. According to the report, no human-to-human transmission was identified associated with this case.[12]

Risk Assessment:

1. What is the public health risk of additional human cases of infection with swine influenza viruses?

[12] US CDC FluView. Weekly US Influenza Surveillance Report: Key Updates for Week 46, ending November 15, 2025. Available at https://www.cdc.gov/fluview/surveillance/2025-week-46.html.

Swine influenza viruses circulate in swine populations in many regions of the world. Depending on geographic location, the genetic characteristics of these viruses differ. Most human cases are exposed to swine influenza viruses through contact with infected animals or contaminated environments. Human infection tends to result in mild clinical illness in most cases. Since these viruses continue to be detected in swine populations, further human cases are expected. The impact to public health if additional sporadic cases are detected is minimal. The overall risk of additional sporadic human cases is low.

2. What is the likelihood of sustained human-to-human transmission of swine influenza viruses?
No sustained human-to-human transmission was identified associated with the events described above. Current evidence suggests that contemporary swine influenza viruses have not acquired the ability of sustained transmission among humans, therefore sustained human-to-human transmission is thus currently considered unlikely.

3. What is the likelihood of international spread of swine influenza viruses by travelers?
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 current evidence suggests that these viruses have not acquired the ability to transmit easily among humans.

Overall risk management recommendations:

Surveillance and investigations

- Due to the constantly evolving nature of influenza viruses, WHO continues to stress the importance of global strategic surveillance in animals and humans to detect virologic, epidemiologic and clinical changes associated with circulating influenza viruses that may affect human (or animal) health. Continued vigilance is needed within affected and neighbouring areas to detect infections in animals and humans. Close collaboration with the animal health and environment sectors is essential to understand the extent of the risk of human exposure and to prevent and control the spread of animal influenza. WHO has published guidance on surveillance for human infections with avian influenza A(H5) viruses.
- As the extent of influenza virus circulation in animals is not clear, epidemiologic and virologic surveillance and the follow-up of suspected human cases should continue systematically. Guidance on investigation of non-seasonal influenza and other emerging acute respiratory diseases has been published on the WHO website.
- Countries should increase avian influenza surveillance in domestic and wild birds, enhance surveillance for early detection in cattle populations in countries where HPAI is known to be circulating, include HPAI as a differential diagnosis in non-avian species, including cattle and other livestock populations, with high risk of exposure to HPAI viruses; monitor and investigate cases in non-avian species, including livestock, report cases of HPAI in all animal species, including unusual hosts, to WOAH and other international organizations, share genetic sequences of avian influenza viruses in publicly available databases, implement preventive and early response measures to break the HPAI transmission cycle among animals through movement restrictions of infected livestock holdings and strict biosecurity measures in all holdings, employ good production and hygiene practices when handing animal products, and protect persons in contact with suspected/infected animals.[13] More guidance can be found from WOAH and FAO.

[13] World Organisation for Animal Health. Statement on High Pathogenicity Avian Influenza in Cattle, 6 December 2024. Available at: https://www.woah.org/en/high-pathogenicity-avian-influenza-hpai-in-cattle/.

- When there has been human exposure to a known outbreak of an influenza A virus in domestic poultry, wild birds or other animals – 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)/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.
- Vigilance for the emergence of novel influenza viruses with pandemic potential should be maintained at all times including during a non-influenza emergency. In the context of the co-circulation of SARS-CoV-2 and influenza viruses, WHO has updated and published practical guidance for integrated surveillance.

Notifying WHO

- All human infections caused by a new subtype of influenza virus are notifiable under the International Health Regulations (IHR, 2005).[14] State Parties to the IHR (2005) are required to immediately notify WHO of any laboratory-confirmed[15] case of a recent human infection caused by an influenza A virus with the potential to cause a pandemic[16]. Evidence of illness is not required for this report. Evidence of illness is not required for this report.
- WHO published the case definition for human infections with avian influenza A(H5) virus requiring notification under IHR (2005): https://www.who.int/teams/global-influenza-programme/avian-influenza/case-definitions.

Virus sharing and risk assessment

- It is critical that these influenza viruses from animals or from humans are fully characterized in appropriate animal or human health influenza reference laboratories. Under WHO's Pandemic Influenza Preparedness (PIP) Framework, Member States are expected to share influenza viruses with pandemic potential on a **timely basis**[17] with a WHO Collaborating Centre for influenza of GISRS. The viruses are used by the public health laboratories to assess the risk of pandemic influenza and to develop candidate vaccine viruses.
- The Tool for Influenza Pandemic Risk Assessment (TIPRA) provides an in-depth assessment of risk associated with some zoonotic influenza viruses – notably the likelihood of the virus gaining human-to-human transmissibility, and the impact should the virus gain such transmissibility. TIPRA maps relative risk amongst viruses assessed using multiple elements. The results of TIPRA complement those of the risk assessment provided here, and those of prior TIPRA analyses will be published at http://www.who.int/teams/global-influenza-programme/avian-influenza/tool-for-influenza-pandemic-risk-assessment-(tipra).

[14] World Health Organization. Case definitions for the four diseases requiring notification in all circumstances under the International Health Regulations (2005).

[15] World Health Organization. Manual for the laboratory diagnosis and virological surveillance of influenza (2011). Available at: https://apps.who.int/iris/handle/10665/44518.

[16] World Health Organization. Pandemic influenza preparedness framework for the sharing of influenza viruses and access to vaccines and other benefits, 2nd edition. Available at: https://iris.who.int/handle/10665/341850.

[17] World Health Organization. Operational guidance on sharing influenza viruses with human pandemic potential (IVPP) under the Pandemic Influenza Preparedness (PIP) Framework (2017). Available at: https://apps.who.int/iris/handle/10665/259402.

Risk reduction

- Given the observed extent and frequency of avian influenza in poultry, wild birds and some wild and domestic mammals, the public should avoid contact with animals that are sick or dead from unknown causes, including wild animals, and should report dead birds and mammals or request their removal by contacting local wildlife or veterinary authorities.
- Eggs, poultry meat and other poultry food products should be properly cooked and properly handled during food preparation. Due to the potential health risks to consumers, raw milk should be avoided. WHO advises consuming pasteurized milk. If pasteurized milk isn't available, heating raw milk until it boils makes it safer for consumption.
- WHO has published practical interim guidance to reduce the risk of infection in people exposed to avian influenza viruses.

Trade and travellers

- WHO advises that travellers 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 excreta. Travelers should also wash their hands often with soap and water. All individuals should follow good food safety and hygiene practices.
- WHO does not advise special traveller screening at points of entry or restrictions with regards to the current situation of influenza viruses at the human-animal interface. For recommendations on safe trade in animals and related products from countries affected by these influenza viruses, refer to WOAH guidance.

Links:

WHO Human-Animal Interface web page
https://www.who.int/teams/global-influenza-programme/avian-influenza
WHO Influenza (Avian and other zoonotic) fact sheet
https://www.who.int/news-room/fact-sheets/detail/influenza-(avian-and-other-zoonotic)
WHO Protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases
https://www.who.int/publications/i/item/WHO-WHE-IHM-GIP-2018.2
WHO Public health resource pack for countries experiencing outbreaks of influenza in animals:
https://www.who.int/publications/i/item/9789240076884
Cumulative Number of Confirmed Human Cases of Avian Influenza A(H5N1) Reported to WHO
https://www.who.int/teams/global-influenza-programme/avian-influenza/avian-a-h5n1-virus
Avian Influenza A(H7N9) Information
https://www.who.int/teams/global-influenza-programme/avian-influenza/avian-influenza-a-(h7n9)-virus
World Organisation of Animal Health (WOAH) web page: Avian Influenza
https://www.woah.org/en/home/
Food and Agriculture Organization of the United Nations (FAO) webpage: Avian Influenza
https://www.fao.org/animal-health/avian-flu-qa/en/
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http://www.offlu.org/