Influenza at the human-animal interface

Summary and risk assessment, from 20 July to 27 September 2024[1]

- **New human cases[2]:** From 20 July to 27 September 2024, the detection of influenza A(H5) virus in one human, influenza A(H5N1) in eight humans, influenza A(H9N2) virus in two humans, influenza A(H1N1) variant ((H1N1)v) virus in two humans, and influenza A(H3N2)v virus in two humans were reported officially. Additionally, one human case of infection with an influenza A(H1N2)v virus and three human cases of infection with A(H3N2)v viruses were detected.
- **Circulation of influenza viruses with zoonotic potential in animals:** high pathogenicity avian influenza (HPAI) events in poultry and non-poultry 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]
- **Risk assessment[5]:** Based on information available at the time of the risk assessment, the overall public health risk from currently known influenza viruses at the human-animal interface has not changed, and 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.
- **Risk management:** New candidate vaccine viruses (CVVs) for zoonotic influenza viruses for pandemic preparedness purposes were selected and a detailed summary of characterization of zoonotic influenza viruses (including avian influenza and swine influenza) since February 2024 is published through a recent WHO consultation.[6]
- **IHR compliance:** All human infections caused by a new influenza subtype are required to be reported under the International Health Regulations (IHR, 2005).[7] This includes any influenza A virus that has demonstrated the capacity to infect a human and its haemagglutinin 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.

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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. Genetic and antigenic characteristics of zoonotic influenza A viruses and development of candidate vaccine viruses for pandemic preparedness, September 2024. Available at: https://cdn.who.int/media/docs/default-source/vcm-southern-hemisphere-recommendation-2025/202409_zoonotic_recommendations_final.pdf?sfvrsn=20be903a_3

[7] 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).

Avian influenza viruses in humans

Current situation:

A(H5), United States of America (USA)

Since the last risk assessment of 19 July 2024, influenza A(H5) virus has been detected in six humans in the USA; of these, five are confirmed through partial or whole genome sequencing as an A(H5N1) virus. On 19 July 2024, the USA notified WHO of two cases of human infection with avian influenza A(H5) viruses in adults from Colorado who had performed disposal and culling operations prior to symptom onset at a commercial poultry facility where A(H5N1) clade 2.3.4.4b, genotype B3.13 viruses had been detected in poultry.

The two individuals reported their symptoms to the Colorado Department of Public Health and Environment during daily active monitoring on the farm conducted by public health staff. Specimens were collected and were initially tested at the Colorado State Public Health Laboratory using the United States Centers for Disease Control and Prevention (US CDC) influenza A(H5) assay before being sent to CDC for further testing. The specimens were received and tested at CDC on 17 and 18 July. Specimens from the two individuals were positive for avian influenza A and A(H5) virus using diagnostic reverse transcription-polymerase chain reaction (RT-PCR).

Sequencing of the virus from one of these cases at CDC confirmed the neuraminidase (NA) is an N1 and the virus is a A(H5N1) virus from clade 2.3.4.4b. Of the six gene segments sequenced, the sequences are closely related to the virus sequence from a previous human case, as well as viruses detected in recent poultry outbreaks and infected dairy cattle herds made available from the United States Department of Agriculture (USDA). Further details are given here.

Additionally, on 26 July 2024, the USA notified WHO of three more laboratory-confirmed human cases of avian influenza A(H5) infection detected in the State of Colorado in adults >18 years. Prior to symptom onset, all three had also performed disposal and culling operations at a commercial poultry farm where high pathogenicity avian influenza (HPAI) A(H5N1) virus clade 2.3.4.4b, genotype B3.13, had been detected in poultry.

The three individuals reported their symptoms to the public health staff from the Colorado Department of Public Health during daily active monitoring on the farm. Specimens were collected and initially tested at the Colorado State Public Health Laboratory using the US CDC influenza A(H5) assay before being sent to the CDC for confirmatory testing. The specimens were received and tested at CDC on 23 and 24 July 2024. Specimens from the three individuals were positive for influenza A and A(H5) virus using diagnostic RT-PCR at CDC.

Full genome sequencing of viruses from these three human cases at confirmed the NA for each of these three viruses is an N1, and the viruses are a A(H5N1) viruses from clade 2.3.4.4b. The sequences are closely related to viruses detected in recent poultry outbreaks and infected dairy cattle herds and made available from USDA. The sequences, in addition to the one mentioned above, maintain primarily avian genetic characteristics, and lack changes that would make them better adapted to spread among humans. They also do not contain any changes suggesting an increase in disease severity or adaptation to human infection or spread. Furthermore, there are no markers known to be associated with influenza antiviral resistance.[8],[9]

[8] US Centers for Disease Control and Prevention. CDC A(H5N1) Bird Flu Response Update, July 26, 2024. Available at: https://www.cdc.gov/bird-flu/spotlights/h5n1-response-07262024.html.

[9] US Centers for Disease Control and Prevention. CDC A(H5N1) Bird Flu Response Update, August 2, 2024. Available at: https://www.cdc.gov/bird-flu/spotlights/h5n1-response-08022024.html.

All five individuals have mild illnesses and were offered antiviral medication. No further cases associated with this case were detected.

On 6 September 2024, the USA notified WHO of one additional laboratory-confirmed human case of avian influenza A(H5) virus infection in an individual aged >18 years, with a history of severe underlying disease in the state of Missouri. The individual developed symptoms on 20 August 2024. Symptoms were acute in onset and included the following: chest pain, nausea, vomiting, diarrhea, and weakness. The patient was hospitalized, treated with oseltamivir and recovered from the illness. The individual reported not having contact with animals within the 10 days prior to symptom onset; however, the investigation into potential sources of exposure was ongoing at the time of reporting.

A nasopharyngeal swab specimen was collected and tested by with a multiplex PCR respiratory panel at the hospital laboratory, where the specimen was positive for influenza A virus, and negative for both the A(H1) and A(H3) markers. Based on surveillance submission guidance for influenza A unsubtypable results, the specimen was forwarded to the Missouri State Public Health Laboratory (MSPHL) with the Department of Health and Senior Services where the specimen underwent further testing. The specimen was received at CDC on 4 September and confirmed to be positive for influenza A(H5) on 5 September. At the time of reporting, there was no information on the N-type or other characteristics of the virus. Genetic sequencing and virus culture were underway at the time or reporting.

One close contact of the patient developed symptoms of cough and tiredness the same day as the case; however, no diagnostic testing was performed, and the individual recovered from their illness without seeking medical care. This individual reported not having contact with animals within the 10 days prior to symptom onset. No additional illnesses have been reported among close contacts of the case. Case investigation and surveillance activities were ongoing by public health officials at the time of reporting.

On 13 September, the US CDC announced the results of partial genome sequencing indicating the virus from this case belongs to H5 clade 2.3.4.4b and the neuraminidase as N1.[10]

Low pathogenicity and high pathogenicity avian influenza (HPAI) viruses have been detected in birds in the United States. Since 2022, the HPAI A(H5) virus has been detected in commercial and backyard flocks in 48 states, impacting over 100 million birds. To date, fifteen people have tested positive for A(H5) virus in the United States since 2022. The first case occurred in April 2022 in Colorado in an individual who had performed poultry culling; the next four occurred between April and June 2024 in Texas, Michigan (two cases), and in one individual in Colorado who worked with dairy cattle; followed by nine cases associated with poultry disposal and culling operations at two farms in Colorado; and one case in an individual in Missouri with no reported history of exposure to animals at the time of reporting. A(H5N1) virus infections in dairy cattle and wild and domestic birds continue to be reported in the USA.[11]

A(H5N1), Cambodia

Since the last risk assessment of 19 July 2024, three human cases of influenza A(H5N1) virus infection were reported in Cambodia.

On 31 July 2024, Cambodia notified WHO of one case of human infection with influenza A(H5N1) in a four-year-old boy in Svay Rieng province who had symptom onset on 22 July 2024, with fever,

[10] United States Centers for Disease Control and Prevention. CDC A(H5N1) Bird Flu Response Update September 13, 2024. Available at: https://www.cdc.gov/bird-flu/spotlights/h5n1-response-09132024.html.
[11] United States Department of Agriculture. Highly Pathogenic Avian Influenza (HPAI) Detections in Livestock, 19 July 2024. Available at: https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/livestock.

cough, and dyspnea. On 24 July, he was hospitalized with high fever and respiratory symptoms at a district hospital. On 28 July, he was transferred to a provincial hospital and on 29 July 2024, he was transferred and admitted and treated at Kantha Bopha Hospital in Phnom Penh. Oropharyngeal and nasopharyngeal samples were collected, and antiviral treatment was started on 29 July. On 30 July, the National Institute of Public Health (NIPH) and Institut Pasteur du Cambodge (IPC) confirmed the samples positive for A(H5N1) by RT-PCR. According to the investigation, he was exposed to a dead chicken about 12 days before his onset of illness. On 1 August 2024, the World Organisation for Animal Health (WOAH) received a report from the National Animal Health and Production Research Institute (NAHPRI) in Cambodia that animal samples collected from backyard poultry in the village where this case lives tested positive for HPAI A(H5N1) viruses.[12]

On 3 August 2024, a second case was notified to WHO in a 16-year-old female also from Svay Rieng province. She had an onset of illness (fever and runny nose) on 29 July. On 1 August, she was hospitalized with high fever and respiratory symptoms at a district hospital. On 2 August, she was transferred to the referral provincial hospital before being transferred to Kantha Bopha Hospital where she required mechanical ventilation due to severe bilateral pneumonia. Oropharyngeal and nasopharyngeal samples were collected at the referral provincial hospital before transfer for testing through severe acute respiratory infection (SARI) surveillance. On August 3, NIPH and IPC confirmed the samples positive for A(H5N1) by RT-PCR. She was treated with oseltamivir and antibiotics. According to the investigation, she was exposed to dead chickens at her household about one week before her onset of illness.

On 20 August 2024, a third case was notified to WHO in a 15-year-old girl, with no underlying conditions, from Prey Veng Province. She had an onset of fever on 11 August and was hospitalized on 17 August at a SARI sentinel site with continued fever, cough, sore throat, and difficulty breathing. Nasopharyngeal and oropharyngeal swab specimens were collected on 17 August and treatment with antivirals was initiated. On 20 August, the samples tested positive for influenza A(H5N1) by RT-PCR at NIPH and results were confirmed by IPC on the same day. She passed away on 20 August. According to the early investigation, about five days before the onset of illness, there were reports of dead poultry in the village and she assisted in preparing them for consumption. Test results from samples collected from chickens and ducks from the village are pending.[13]

No further cases were detected among close contacts of these three cases, including healthcare workers. The two cases from Svay Rieng are from different areas and are not epidemiologically linked and have recovered.

The HA of the viruses from these three cases belongs to the H5 clade 2.3.2.1c. Sequencing results from these viruses had with close similarity to the viruses circulating in Cambodia and Southeast Asia since 2013-2014.

According to reports received by WOAH, various influenza A(H5) subtypes continue to be detected in wild and domestic birds in Asia, Europe and the Americas. Infections in non-human mammals are

[12] World Organisation for Animal Health (WOAH). WAHIS. EVENT 5754. Cambodia - High pathogenicity avian influenza viruses (poultry) (Inf. with). Available at: https://wahis.woah.org/#/in-review/5754?fromPage=event-dashboard-url.

[13] World Health Organization (2 September 2024). Disease Outbreak News; Avian Influenza A (H5N1) in Cambodia. Available at: https://www.who.int/emergencies/disease-outbreak-news/item/2024-DON533.

also reported, including in marine and land mammals.[14] A list of bird and mammalian species affected by HPAI A(H5) viruses is maintained by FAO.[15]

Risk Assessment for avian influenza A(H5) viruses:

1. What is the current public health risk of additional human cases of infection with avian influenza A(H5) viruses?
Most human cases so far have been infections 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. While 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 unusual. The impact for public health if additional cases are detected is minimal. The current overall public health risk of additional human cases is low.

2. What is the likelihood of sustained human-to-human transmission of avian influenza A(H5) viruses?
No sustained human-to-human transmission has been identified associated with the recent reported human infections with avian influenza A(H5). 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.

Available evidence suggests that influenza A(H5) viruses circulating have not acquired the ability to efficiently transmit between people, therefore sustained human-to-human transmission is thus currently considered unlikely at this time.

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 19 July 2024, one human case of infection with an A(H9N2) influenza virus was notified to WHO from China on 11 September 2024 in a 3-year-old girl from Guangdong province. She had an onset of illness on 12 August and on 19 August, she was seen at a hospital for treatment for bronchitis. She had mild illness, was not hospitalized and has recovered. Respiratory samples were collected on the same day as part of routine surveillance were confirmed positive for influenza A(H9N2) on 22 August.

According to the notification, the case had no known exposure to live poultry or travel history prior to the onset of illness. All close contacts have completed their 10-day follow up, with no additional cases found. Environmental samples collected from the patient's home tested negative for influenza A viruses.

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

[15] 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.

A(H9N2), Ghana

Since the last risk assessment of 19 July 2024, one human case of infection with an A(H9N2) influenza virus was notified to WHO from Ghana on 26 August 2024 in a child under five years of age residing in the Upper East region, adjacent to the border with Burkina Faso. The child had an onset of illness 5 May 2024, with a sore throat, fever and cough. On 7 May, the patient was seen at a local hospital, diagnosed with an influenza-like illness, managed as an outpatient and respiratory samples were collected as part of routine surveillance. The samples tested positive for seasonal influenza A(H3N2) virus infection by polymerase chain reaction on 15 May at the Ghana National Influenza Centre (NIC), Noguchi Memorial Institute for Medical Research. On 9 July, genomic sequence analysis conducted by the Ghana NIC indicated an avian influenza A(H9) virus. The NIC shipped an aliquot of the sample to WHO Collaborating Centres (CC) located in the United Kingdom of Great Britain and Northern Ireland (The Francis Crick Institute) and the United States of America (US CDC), for additional testing and validation. On 6 August, the US CDC confirmed the samples as positive for influenza A(H9N2) virus.

Following confirmation of the A(H9N2) virus infection, the regional health authorities visited the patient and observed they were experience a new onset of respiratory symptoms. Serum and respiratory specimens were collected on that day and shipped to the NIC for further analysis. The samples tested negative for influenza and the patient has fully recovered.

The patient had no known history of exposure to poultry or any person with similar symptoms prior to onset of illness. Respiratory samples from close contacts tested negative for influenza. No additional cases of human infection with influenza A(H9N2) associated with this case have been identified in the community. Illness among poultry has been reported in the Upper East Region, but the cause of the poultry disease had not been confirmed at the time of reporting. However, low pathogenicity avian influenza influenza A(H9N2) has been reported in Ghanaian poultry farms since November 2017.

This is the first A(H9N2) human infection reported from Ghana to WHO.[16]

Risk Assessment for avian influenza A(H9N2):

1. What is the 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 in most cases. Nearly 130 human infections with A(H9N2) cases have been reported to date since 2003, and six of these have been severe or fatal and three of these were known to have underlying medical conditions. Since the virus is endemic in poultry in multiple continues in Africa and Asia[17], further human cases associated with exposure to infected poultry are expected but remain unusual. The impact to public health if additional cases are detected is minimal. The overall public health risk of additional human cases is low.

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

[16] World Health Organization (20 September 2024). Disease Outbreak News; Avian Influenza A (H9N2) - Ghana. Available at: https://www.who.int/emergencies/disease-outbreak-news/item/2024-DON534.

[17] 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.

At the present time, no sustained human-to-human transmission has been identified associated with the event described above. Current evidence suggests that influenza A(H9N2) viruses from these cases 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 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

Current situation:

Since the last risk assessment on 19 July 2024, detections of influenza A(H1N1)v viruses in two humans and influenza A(H3N2)v viruses in two humans were reported officially. Additionally, one human case of infection with an influenza A(H1N2)v and one human case of infection with an influenza A(H3N2)v virus were detected.

Influenza A(H1N1)v, USA

On 16 August 2024, the USA notified WHO of a human infection caused by an influenza A(H1N1)v virus. According to the report, the case is a >18-year-old person from Ohio, with comorbidities, and no travel history to other states or internationally. On 4 August 2024, the case developed acute respiratory illness with cough, congestion, fever, and headache, and sought medical care for a chronic medical condition on 6 August. The case was hospitalized for observation due to underlying medical conditions, received influenza antiviral treatment, and has recovered from their illness. An investigation by public health officials in Ohio identified that the case had attended an agricultural fair in Ohio within 10 days prior to their illness onset. Additional investigation did not identify respiratory illness in any of the cases contacts.

An upper respiratory specimen collected from the case on 6 August tested positive for influenza A virus, but negative for A(H1)pdm09 or A(H3) subtypes at the hospital laboratory. A second respiratory specimen was collected from the case on 7 August, which was then tested at the Ohio Department of Health laboratory on 8 August, where real-time RT-PCR analysis indicated it was positive for influenza A virus but negative for contemporary human influenza A viruses representing either A(H1)pdm09 or A(H3) subtypes. The specimen was sent to the US CDC and was received on 14 August. CDC diagnostic real-time RT-PCR testing and sequencing confirmed the sample was positive for an influenza A(H1N1)v virus on 15 August. Additional genetic and virologic characterization is currently underway. No additional cases of human infection with A(H1N1)v virus associated with this case have been identified.[18]

Influenza A(H1N1)v, Viet Nam

On 19 August 2024, the National IHR Focal Point of Viet Nam notified WHO of a human case of influenza A(H1N1)v virus infection in a 70-year-old female, with comorbidities, from Son La province, a northern mountainous province in Viet Nam bordering the Lao Peoples Democratic Republic.

She developed fever, fatigue, and loss of appetite one week after returning from spending a month in her home village in Hung Yen province. On 1 June 2024, she was admitted to a district hospital due to persistent symptoms and was diagnosed with pneumonia in addition to her underlying medical conditions. On 5 June, a rapid test confirmed influenza A. On the same day she was transferred to the

[18] US Centers for Disease Control and Prevention. Flu View. Past Weekly Surveillance Reports. Available at: https://www.cdc.gov/flu/weekly/weeklyarchives2023-2024/week33.htm.

National Hospital for Tropical Diseases (NHTD) where she underwent treatment for six days but died on 11 June.

A sample collected on 5 June was tested RT-PCR which confirmed influenza A virus on 18 June, but subtyping was not determined. On 1 August, genomic sequencing identified influenza A(H1N1)v virus, which was confirmed by the WHO Collaborating Centre for influenza at the US CDC on 5 August. Further characterization of the virus is ongoing.

Epidemiological investigations revealed that the patient lived alone and had limited contact with a few villagers and caregivers during her illness in Son La province. From June to 11 August, there have been no reports of respiratory symptoms among contacts, including healthcare workers of the case, or outbreaks in the community in Son La where the patient lived. There have been no disease outbreaks among livestock, including pigs, around the case's residence in Son La. There have been no official or unofficial reports from the case's home village in Hung Yen province. At the time of reporting, the source of exposure to the virus remains unknown.

This is the first human influenza A(H1N1)v infection identified in Viet Nam.[19]

Influenza A(H1N2)v, USA

On 23 August 2024, the US CDC announced the detection of a human infection with an influenza A(H1N2)v virus in a person aged >18 years from Pennsylvania. The patient developed symptoms and sought healthcare during the week ending 10 August 2024. The patient was briefly hospitalized due to underlying medical conditions and has since recovered. The patient had occupational exposure to swine. No symptoms were reported among close contacts of the case after the case's symptom onset, and no human-to-human transmission related to this case has been identified.[20]

Influenza A(H3N2)v, Canada

On 12 July 2024, Canada notified WHO of a human infection with an influenza A(H3N2)v virus in an individual aged <18 years from Saskatchewan. On 10 June 2024, the case developed mild acute respiratory infection symptoms. On 16 June, the case sought emergency medical care and a nasopharyngeal swab was collected. The case was not hospitalized and has since recovered.

Local public health officials found no known exposure to symptomatic persons or animals prior to the individual's illness onset. The case lives on a farm with cattle and swine, none of which were reported to be symptomatic, and reported no direct contact with the livestock. No contacts of the case developed symptoms.

This is the first influenza A(H3N2)v virus infection identified in Canada in 2024, and the fourth case of human influenza A(H3N2)v reported to the Public Health Agency of Canada since 2005.[21]

Influenza A(H3N2)v, USA

On 8 August 2024, the USA notified WHO of a human case of infection with an influenza A(H3N2)v virus in an individual aged <18 years in Colorado who developed illness on 8 July 2024. The case sought outpatient medical care on 9 July with fever, shortness of breath, and fatigue. The patient

[19] World Health Organization (4 September 2024). Disease Outbreak News; Influenza A(H1N1) variant virus – Viet Nam. Available at: https://www.who.int/emergencies/disease-outbreak-news/item/2024-DON532.
[20] US Centers for Disease Control and Prevention. Flu View. Past Weekly Surveillance Reports. Available at: https://www.cdc.gov/flu/weekly/weeklyarchives2023-2024/week33.htm.
[21] Public Health Agency of Canada. Human emerging respiratory pathogens bulletin: Issue 91, July 2024. Available at: https://www.canada.ca/en/public-health/services/surveillance/human-emerging-respiratory-pathogens-bulletin/2024/july.html#a2.3.

was not hospitalized and has recovered from their illness. The patient did not receive influenza antiviral treatment for their illness. A nasopharyngeal swab collected from the patient on 9 July was positive for influenza A virus. The specimen was then tested at the Colorado State Public Health Laboratory on 2 August, where RT-PCR analysis was presumptive positive for influenza A(H3)v virus. On 6 August, the respiratory specimen was received at CDC and diagnostic RT-PCR confirmed an influenza A(H3N2)v virus.

Investigation by public health officials in Colorado identified that the patient had attended an agricultural event within ten days prior to their illness onset. Additional investigation did not identify respiratory illnesses in any of the patient's close contacts or household contacts. No person-to-person transmission of influenza A(H3N2)v virus associated with this patient has been identified. Additional public health response efforts are ongoing. No additional cases of human infection with A(H3N2)v virus have been identified.

This is the first influenza A(H3N2)v virus infection identified in the United States during 2024.[22]

On 16 August 2024, the US CDC announced the detection of a human infection with an influenza A(H3N2)v virus in a person aged < 18 years from Michigan, who sought healthcare during the week ending 27 July. The individual was admitted to hospital due to a pre-existing condition and was recovering at the time of the announcement. Investigation by local public health officials did not find any exposure to swine or attendance at an agricultural event prior to patient's illness onset. Further investigation did not identify illness among close contacts of the patient.[23]

On 20 September, the US CDC announced the detection of two human cases of infection with influenza A(H3N2)v viruses in Minnesota. Both patients where individuals aged < 18 years, sought healthcare during the week ending 7 September, were not hospitalized and recovered from their illnesses. According to the local investigation, there was no link between the patients other than them having attended the same agricultural fair before illness onset. Both cases had contact with swine at the agricultural fair (one reported direct contact and the other reported direct contact). No human-to-human transmission of influenza A(H3N2)v associated with either case was identified.[24]

Risk Assessment:

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

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 but remain unusual. The impact for public health if additional cases are detected is minimal. The overall risk of additional human cases is low.

[22] US Centers for Disease Control and Prevention. Flu View. Past Weekly Surveillance Reports. Available at: https://www.cdc.gov/flu/weekly/weeklyarchives2023-2024/week31.htm.
[23] US Centers for Disease Control and Prevention. Flu View. Past Weekly Surveillance Reports. Available at: https://www.cdc.gov/flu/weekly/weeklyarchives2023-2024/week32.htm.
[24] US Centers for Disease Control and Prevention. Flu View. Weekly US Influenza Surveillance Report: Key Updates for Week 37, ending September 14, 2024. Available at: https://www.cdc.gov/fluview/surveillance/2024-week-37.html.

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 event 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 suggest that these viruses have not acquired the ability to transmit easily among humans.

For more information on zoonotic viruses, see the report from the WHO Consultation on the Composition of Influenza Virus Vaccines for Use in the 2025 Southern Hemisphere Influenza Season held on 23-26 September 2024 at the following link: Genetic and antigenic characteristics of zoonotic influenza A viruses and development of candidate vaccine viruses for pandemic preparedness, September 2024.

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.
- 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 maintain enhanced surveillance in domestic and wild birds, 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, prevent the introduction and spread in animals by implementing through strict biosecurity measures in livestock holdings, employ good production and hygiene practices when handing animal products, and protect persons in contact with suspected/infected animals.[25]
- 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

[25] World Organisation for Animal Health. Statement on High Pathogenicity Avian Influenza in Cattle, 8 June 2024. Available at: https://www.woah.org/en/high-pathogenicity-avian-influenza-in-cattle/#:~:text=The%20recently%20reported%20detections%20of,H5N1%20viruses%20becoming%20better%20adapted.

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 of 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 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).[26] State Parties to the IHR (2005) are required to immediately notify WHO of any laboratory-confirmed[27] case of a recent human infection caused by an influenza A virus with the potential to cause a pandemic[28]. Evidence of illness is not required for this report.

Virus sharing and risk assessment

- It is critical that these influenza viruses from animals or from people 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**[29] 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).

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.

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

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

[28] 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

[29] 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/10665/25940

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/
OFFLU
http://www.offlu.org/