

Influenza at the human-animal interface

Summary and risk assessment, from 6 October to 11 November 2022¹

- **New infections²:** From 6 October to 11 November 2022, one human case of infection with an influenza A(H5) virus, three human cases of infection with avian influenza A(H5N1) viruses, one human case of infection with an influenza A(H9N2) virus, one human case of infection with an influenza A(H1N1) variant virus and one human case with an influenza A(H1N2) variant virus were reported officially. Additionally, two human cases of infection with influenza A(H3N2) variant viruses were detected.
- **Risk assessment:** The overall public health risk from currently known influenza viruses at the human-animal interface has not changed, and the likelihood of sustained human-to-human transmission of these viruses remains low. Human infections with viruses of animal origin are expected at the human-animal interface wherever these viruses circulate in animals.
- **IHR compliance:** All human infections caused by a new influenza subtype are required to be reported under the International Health Regulations (IHR, 2005).³ 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.

Avian Influenza Viruses

Current situation:

Avian influenza A(H5) viruses

Since the last risk assessment on 5 October 2022, one human case of influenza A(H5) virus infection was reported from Viet Nam, the detections of A(H5N1) viruses in two individuals were reported from Spain and one human case of influenza A(H5N1) virus infection was reported from China.

On 22 October 2022, the Viet Nam Ministry of Health notified WHO of one laboratory-confirmed case of avian influenza A(H5) infection in a four-year-old girl in Phú Thọ province. She developed cough, fever and jaundice on 5 October 2022. She was admitted to a district hospital on 7 October and then admitted to a provincial hospital where she was diagnosed with renal and liver failure. On 8 October, she was transferred to the Viet Nam National Children's Hospital (VNCH) in Hanoi and for treatment in the intensive care unit. On 10 October, an endotracheal fluid sample was tested by real-time PCR (RT-PCR) at the VNCH laboratory and was positive for avian influenza A(H5) virus. On

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 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 \(2005\)](#).

14 October, an additional specimen was sent to the National Institute of Hygiene and Epidemiology (NIHE) for confirmation; the result was positive by RT-PCR for avian influenza A(H5) virus on 17 October. Determination of the N-type of the virus was not possible.

She lived with her family who raised backyard poultry (chickens and ducks) and one week prior to the onset of symptoms some of the poultry were sick and died. The NIHE, in collaboration with the Department of Animal Health (DAH), the Ministry of Agriculture and Rural Development (MARD) and the locality involved, conducted an epidemiological investigation of the case and implemented disinfection and response measures to curb further spread of the outbreak. Samples from contacts of the case sample and environmental samples from the case's house and surrounding houses tested negative for influenza A(H5) virus. No further cases were detected among her family members. No further outbreaks of illness and death in other poultry flocks were reported.

On 27 September 2022, Spain notified WHO of the detection of avian influenza A(H5N1) in a person from Guadalajara. The virus was detected in a respiratory sample collected from a 19-year-old male who worked at a poultry farm where an outbreak of avian influenza A(H5N1) was confirmed on 20 September. As part of the multisector response to the outbreak on the farm, samples were collected from 12 farm workers on 23 September. On 27 September, the National Microbiology Centre (CNM) confirmed that one of the specimens collected was positive for influenza A(H5N1) virus. Samples were tested using RT-PCR at the CNM. On 28 September, a subsequent sample collected from the individual tested negative for influenza. Samples collected on 28 September from a close contact of the individual also tested negative for influenza.

On 21 October, Spain notified WHO of the detection of avian influenza A(H5N1) in a second person in Guadalajara in a 27-year-old male who worked at the same poultry farm as the first detected case. As part of response measures, cleaning tasks were performed at the farm and samples were collected from all exposed workers on 13 October. This screening yielded one positive influenza A detection in a nasopharyngeal sample from a single worker who was wearing personal protection equipment during the cleaning. The finding was confirmed at the CNM on 21 October. On 22 October, a subsequent sample collected from the individual tested negative for influenza. Samples collected from two close contacts tested negative for influenza. All workers, including the two whose samples were positive for influenza A(H5N1), were asymptomatic during a seven-day follow-up following their last exposure. Both samples from the first and second cases have been sent to the WHO Collaborating Centre for Reference and Research on Influenza at the Crick Worldwide Influenza Centre for further characterization.

On 14 October, China notified WHO of one laboratory-confirmed A(H5N1) virus infection in a 38-year-old female from Guangxi province. She had onset of illness on 22 September 2022, was hospitalized on 25 September with severe pneumonia and passed away on 18 October. She had exposure to backyard poultry. No further cases have been reported among family members. This is the first human case of infection with an avian influenza A(H5N1) virus reported by China since 2015.

According to reports received by the World Organisation for Animal Health (WOAH), various influenza A(H5) subtypes continue to be detected in birds in Africa, Asia, Europe and North America. Since 2021, Europe is experiencing the largest epidemic of high pathogenicity avian influenza viruses ever observed in wild and domestic birds and with a wide geographical extent. Outbreaks in wild and domestic birds continued to be reported through October 2022.

Risk Assessment:

1. What is the likelihood that additional human cases of infection with avian influenza A(H5) viruses will occur?

The overall risk assessment is unchanged. Most human cases were sporadic infections exposed to A(H5) viruses through contact with infected poultry or contaminated environments, including live poultry markets. Since the viruses continue to be detected in animals and related environments, further human cases can be expected. In some cases, the confirmation of infection with influenza A(H5) versus transient contamination of the nasopharynx/oropharynx after exposure to infected birds or contaminated environment remains inconclusive.

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

Even though small clusters of A(H5) virus infections have been reported previously including those involving health care workers, current epidemiological and virological evidence suggests that influenza A(H5) viruses have not acquired the ability of sustained transmission among humans, thus the likelihood is low.

3. What is the risk 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 evidence suggests these viruses have not acquired the ability to transmit easily among humans.

Avian influenza A(H9N2) viruses

Since the last risk assessment on 5 October 2022, one human case of influenza A(H9N2) virus infection was reported from China.

On 14 October, China notified WHO of one laboratory-confirmed A(H9N2) virus infection in a three-year-old boy from Gansu province. He had onset of mild illness on 20 September 2022, was detected through routine influenza-like illness surveillance, was not hospitalized and has recovered. The exposure history was unknown at the time of reporting. No further cases have been reported among family members. Environmental samples tested negative for influenza. Human cases of infection with avian influenza A(H9N2) viruses were last reported by China in June 2022.

Avian influenza A(H9N2) viruses are enzootic in poultry in Asia and increasingly reported in poultry in Africa.

Risk Assessment:

1. What is the likelihood that additional human cases of infection with avian influenza A(H9N2) viruses will occur?

Most human cases occur following exposure to infected poultry or contaminated environments. Reported human infections tend to result in mild clinical illnesses. Since the virus continues to be detected in poultry populations, further human cases can be expected.

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

No case clusters have been reported. Current epidemiologic and virologic evidence suggests that influenza A(H9N2) viruses assessed by GISRS have not acquired the ability of sustained transmission among humans, thus the likelihood is low.

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 the A(H9N2) virus subtype has not been confirmed to have acquired the ability to transmit easily among humans.

Swine Influenza Viruses

Current situation:

Influenza A(H1) variant viruses [A(H1)v]

Since the last risk assessment on 5 October 2022, two human cases of infection with influenza A(H1)v viruses were reported.

On 7 October 2022, Brazil notified WHO of a human case of infection with an influenza A(H1N1)v virus in a 60-year-old female from Paraná State. She lives in a rural area with domestically raised animals including pigs. She developed fever and cough and other symptoms on 5 September 2022 and sought healthcare on 11 September because of worsening symptoms and was hospitalized for one week. No human-to-human transmission has been identified associated with this patient.

A nasopharyngeal sample was collected on 12 September as part of regular respiratory virus surveillance. Real-time PCR was conducted at the State of Paraná Central Public Health Laboratory where a non-subtypable Influenza A virus was identified. The specimen was forwarded to the National Reference Laboratory for respiratory viruses of Fiocruz in Rio de Janeiro where the laboratory confirmed the detection of an influenza A(H1N1)v virus on 5 October. Specimens will be shared with the WHO Collaborating Centre at the United States Centers for Disease Control and Prevention for further characterization.

On 13 October 2022, the Netherlands notified WHO of a human case of infection with an influenza A(H1N2)v virus in a young adult woman. On 1 October 2022, she developed fever and chills and sought healthcare. A respiratory sample was collected and submitted to a diagnostic laboratory for molecular point of care testing. The patient did not have any underlying illness at the time of diagnosis. She was not hospitalized and has recovered. None of her contacts developed symptoms during the 14-day follow-up period.

The sample collected from the case was positive for influenza virus type A. The diagnostic laboratory routinely submits influenza virus-positive specimens for characterization to the Dutch National Influenza Centre location National Institute for Public Health and the Environment (RIVM). The sample collected from the case was received at RIVM on 5 October. On 11 and 12 October, the virus was characterized as a an influenza A(H1N2)v virus, belonging to the Eurasian avian-like clade 1C.2.2. All genome segments were swine Eurasian avian-like A(H1N2) and were similar to viruses detected in several swine populations in Europe in recent years. The clinical sample and virus isolate have been shared with the WHO Collaborating Centre for Reference and Research on Influenza at the Crick Worldwide Influenza Centre for further characterization.

The patient was working as an administrative assistant for a pig farm. She was invited for a work visit to the farm and reported direct, unprotected contact with piglets in the period from 27 to 29 September. After the human case was notified, veterinarians visited the farm. Among the many pigs and piglets at the farm, only a few had minor respiratory symptoms (e.g., sneezing). From these animals, some individual respiratory swabs and group saliva samples were collected. In these materials, swine influenza virus A(H1N2) was detected. Sequencing indicated that the virus detected in the animal samples was the same as that found in the human case and no markers associated with increased virulence for humans were detected.

Influenza A(H3N2) variant viruses [A(H3N2)v]

On 21 October 2022, the United States of America (USA) announced the detection of a case of human infection with an influenza A(H3N2)v virus in a person in Michigan. The illness occurred during week 36 of 2022. The patient is <18 years of age, was not hospitalized, and has recovered from their illness. An investigation by local public health officials found that the patient had indirect

swine exposure at an agricultural fair prior to their illness onset. Additional investigation did not identify respiratory illness in any of the patient's household contacts.⁴

On 4 November 2022, the USA announced the detection of a case of human infection with an influenza A(H3N2)v virus in a person in New Mexico. The illness occurred during week 41 of 2022. The patient is <18 years of age and is recovering from their illness. An investigation by local public health officials found that the patient had swine exposure prior to their illness onset. No person-to-person transmission of A(H3N2)v viruses associated with these events has been identified.⁵

Risk Assessment:

1. What is the likelihood that additional human cases of infection with swine influenza viruses will occur?

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 can be expected.

2. What is the likelihood of human-to-human transmission of swine influenza viruses?

Current evidence suggests that these viruses have not acquired the ability of sustained transmission among humans, thus the likelihood is low.

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

Overall Risk Management Recommendations:

- 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 WOAHA guidance.
- 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.
- Given the observed extent and frequency of avian influenza cases in wild birds, WHO advises the public to strictly avoid contact with sick or dead birds, including wild birds, and to report dead wild birds or request their removal by contacting local wildlife or veterinary authorities.
- Due to the constantly evolving nature of influenza viruses, WHO continues to stress the importance of global surveillance 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

⁴ US Centers for Disease Control and Prevention. Flu View. Past Weekly Surveillance Reports. Available at: <https://www.cdc.gov/flu/weekly/pastreports.htm>.

⁵ US Centers for Disease Control and Prevention. Flu View. Past Weekly Surveillance Reports. Available at: <https://www.cdc.gov/flu/weekly/pastreports.htm>.

animals and humans. Collaboration between the animal and human health sectors is essential. As the extent of influenza viruses 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 here:

<https://www.who.int/publications/i/item/WHO-WHE-IHM-GIP-2018.2>.

- In the current COVID-19 pandemic, vigilance for the emergence of novel influenza viruses of pandemic potential should be maintained. WHO has developed practical guidance for integrated surveillance in the context of the cocirculation of SARS-CoV-2 and influenza viruses. The guidance is available here: [https://www.who.int/publications/i/item/WHO-2019-nCoV-Integrated sentinel surveillance-2022.1](https://www.who.int/publications/i/item/WHO-2019-nCoV-Integrated_sentinel_surveillance-2022.1)
- All human infections caused by a new subtype of influenza virus are notifiable under the International Health Regulations (IHR, 2005).⁶ State Parties to the IHR (2005) are required to immediately notify WHO of any laboratory-confirmed⁷ case of a recent human infection caused by an influenza A virus with the potential to cause a pandemic⁸. Evidence of illness is not required for this report.
- 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 regular and **timely basis**⁹ with the Global Influenza Surveillance and Response System (GISRS), a WHO-coordinated network of public health laboratories. The viruses are used by the public health laboratories to assess the risk of pandemic influenza and to develop candidate vaccine viruses.

Links:

WHO Human-Animal Interface web page

<https://www.who.int/teams/global-influenza-programme/avian-influenza>

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>

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 Influenza A(H7N9) Information

[https://www.who.int/teams/global-influenza-programme/avian-influenza/avian-influenza-a-\(h7n9\)-virus](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 UN (FAO) webpage: Avian Influenza

<https://www.fao.org/animal-health/avian-flu-qa/en/>

OFFLU

<http://www.offlu.org/>

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

⁷ World Health Organization. Manual for the laboratory diagnosis and virological surveillance of influenza (2011). Available at: <https://apps.who.int/iris/handle/10665/44518>

⁸ World Health Organization. Pandemic influenza preparedness framework for the sharing of influenza viruses and access to vaccines and other benefits. Available at: <https://apps.who.int/iris/handle/10665/44796>

⁹ 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>