

Influenza at the human-animal interface

Summary and risk assessment, from 12 November 2022 to 5 January 2023¹

- **New infections²:** From 12 November to 5 January 2023, one human case of infection with an influenza A(H5N6) virus, three human cases of infection with avian influenza A(H9N2) viruses, and one human case of infection with an influenza A(H1N2) variant virus were reported officially.
- **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 11 November 2022, one human case of influenza A(H5N6) virus infection was reported from China.

On 23 November, China notified WHO of one laboratory-confirmed A(H5N6) virus infection in a 54-year-old man from Hunan province. He had onset of illness on 2 November 2022 and was hospitalized on 5 November in critical condition with pneumonia. He was working in a restaurant preparing food. The source of exposure to the virus has not been identified. No further cases have been reported among family members.

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. Detection of A(H5N1) has also been reported recently by several countries in Central and South America and Africa. Since 2021, Europe is experiencing the largest epidemic of high pathogenicity

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 \(2005\)](#).

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 December 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.

A rapid assessment of risk associated specifically with influenza A(H5N1) clade 2.3.4.4b viruses has been published [here](#).

Avian influenza A(H9N2) viruses

Since the last risk assessment on 11 November 2022, three human cases of influenza A(H9N2) virus infection were reported from China on 23 November 2022 (Table 1). All three cases were detected in influenza-like illness surveillance and the cases are not linked. No further cases have been reported among the family members of the cases.

Table 1. Human cases of influenza A(H9N2) reported to WHO from China from 12 November 2022 to 5 January 2023.

Onset date	Reporting province	Gender	Age	Hospitalization date	Condition at time of reporting	Poultry exposure
19 Oct 2022	Hunan	M	58	19 Oct 2022	Severe	Live poultry market
23 Oct 2022	Gansu	F	5	NA	Mild	Unknown
13 Nov 2022	Anhui	M	3	NA	Mild	Live poultry market

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 11 November 2022, one human case of infection with an influenza A(H1)v virus was detected.

On 5 December 2022, WHO received information from the Taiwan Centers for Disease Control (TCDC) concerning a human infection caused by influenza A(H1N2)v virus. This is the first human influenza A(H1N2)v infection reported in Taiwan, China in 2022 and the second since 2021.

A 7-year-old girl living in Changhua County developed influenza-like illness on 24 September 2022. She visited the emergency department on 26 September and a respiratory sample was collected. The sample tested negative for SARS-CoV-2 and positive for influenza A on an influenza rapid test. She was treated with oseltamivir, was not hospitalized, and her symptoms subsided by 28 September. The respiratory isolate was initially identified as an unsubtypeable influenza A virus by PCR at the hospital laboratory and was sent to the TCDC on 6 October for further analysis. The virus was identified as an influenza A(H1N2)v on 11 October.

She lives with her family who own a pig barn in Changhua. She had no direct exposure to pigs. Two other family members had mild respiratory illness before and after the case reported here but all family members tested negative for influenza by PCR. All family members, except the case, tested negative for hemagglutination inhibition (HAI) titres in serum samples.

Based on sequence analysis, the haemagglutinin (HA) gene of the virus from this case belongs to influenza clade 1C, Eurasian Avian-like viruses. The genetic sequence of the virus from this case is different from that of the previous case reported in March 2021, also from an individual in Changhua and with exposure to pigs at a family farm, which carried the HA gene (H1) belonging to swine influenza clade 1A. A thorough epidemiological investigation ruled out any potential links between the two human cases. Samples from pigs at the family's pig barn tested negative for influenza by PCR.

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 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 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>
- All human infections caused by a new subtype of influenza virus are notifiable under the International Health Regulations (IHR, 2005).⁴ State Parties to the IHR (2005) are required to immediately notify WHO of any laboratory-confirmed⁵ case of a recent human infection caused by an influenza A virus with the potential to cause a pandemic⁶. Evidence of illness is not required for this report.

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

⁵ World Health Organization. Manual for the laboratory diagnosis and virological surveillance of influenza (2011). Available at: <https://apps.who.int/iris/handle/10665/44518>

⁶ 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>

- 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**⁷ 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/>

⁷ 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>