Influenza at the human-animal interface

Summary and risk assessment, from 31 August to 5 October 2022[1]

- **New infections[2]:** From 31 August to 5 October 2022, one human case of infection with an avian influenza A(H5N6) virus, one human case of infection with an avian influenza A(H10N3) virus, and one human case of infection with an influenza A(H1N1) variant virus were reported officially. Additionally, three human cases of infection with influenza A(H1N2) 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.
- **Risk management:** Selection of new candidate vaccine viruses (CVVs) for zoonotic influenza viruses for pandemic preparedness purposes was done during a recent WHO consultation.[3]
- **IHR compliance:** All human infections caused by a new influenza subtype are required to be reported under the International Health Regulations (IHR, 2005).[4] 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 30 August 2022, one human case of influenza A(H5N6) virus infection was reported from China.

On 28 September 2022, China notified WHO of one laboratory-confirmed case of human infection with an avian influenza A(H5N6) virus. The case is a 3-year-old boy from Guangxi province with an onset of illness on 1 September 2022. He was hospitalized for severe pneumonia on 11 September and remained hospitalized in severe condition at the time of reporting. He had exposure to backyard poultry before illness onset. None of the environmental samples collected by local authorities tested positive for influenza. No family members have developed symptoms at the time of reporting of these cases.

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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 Health Organization. Antigenic and genetic characteristics of zoonotic influenza A viruses and development of candidate vaccine viruses for pandemic preparedness in the 2022 - 2023 northern hemisphere influenza season. Available at: https://cdn.who.int/media/docs/default-source/influenza/who-influenza-recommendations/vcm-northern-hemisphere-recommendation-2022-2023/202203_zoonotic_vaccinevirusupdate.pdf?sfvrsn=29b24f50_7

[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).

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.

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.

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 more detailed assessment of risk associated specifically with influenza A(H5N6) has been published here.

Avian influenza A(H7N9) viruses

There have been no publicly available reports from animal health authorities in China or other countries on positive influenza A(H7N9) virus detections in animals in recent months.[5]

Overall, the risk assessment has not changed.

Avian influenza A(H10N3) viruses

Since the last risk assessment on 30 August 2022, one human case of infection with an influenza A(H10N3) virus was reported from China. A 33-year-old male from Zhejiang province developed fever, a cough and chest pain on 11 June 2022. He was admitted to hospital on 15 June 2022 with pneumonia. He later developed severe pneumonia and respiratory failure and has now recovered. The case is a butcher and had exposure to backyard poultry. No samples collected from the environment of the case's residence and workplace tested positive for influenza. No family members had developed symptoms at the time of reporting. Blood samples collected for serological testing from close contacts and individuals with similar exposure risks did not identify any further cases.

This is the second case of human A(H10N3) infection detected in China and globally. The first case had illness onset in April 2021 and also had severe illness.

Risk Assessment:

1. What is the likelihood that additional human cases of infection with avian influenza A(H10N3) viruses will occur?

[5] Food and Agriculture Organization of the United Nations. H7N9 Situation Update. www.fao.org/ag/againfo/programmes/en/empres/H7N9/situation_update.html

This is the second human infection with avian influenza A(H10N3) to be detected. Human infections with avian influenza A(H10) viruses have been detected and reported previously. The extent of circulation and epidemiology of these viruses in birds is unclear. Avian influenza A(H10N3) viruses with different genetic characteristics have been detected previously in migratory and other wild birds since the 1970s. Wherever avian influenza A(H10N3) viruses circulate in bird populations sporadic human cases of infection can be expected.

2. What is the likelihood of human-to-human transmission of avian influenza A(H10N3) viruses?
Epidemiologic and virologic evidence on the likelihood of sustained transmission of this virus among humans is limited at this time. However, no case clusters or other cases have been reported in association with this single case. Thus, the likelihood is low based on the current limited evidence.

3. What is the likelihood of international spread of avian influenza A(H10N3) 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 based on current limited evidence.

Swine Influenza Viruses

Current situation:

Influenza A(H1N1) variant viruses [A(H1N1)v]

Since the last risk assessment on 30 August 2022, one human case of infection with an influenza A(H1N1)v virus was reported in China. A 6-year-old girl from Shaanxi province developed mild respiratory illness on 8 April 2022. She was sampled as part of influenza-like illness (ILI) surveillance. She was not hospitalized. The source of exposure to the virus was unknown at the time of reporting and samples collected as part of environmental testing were not positive for influenza viruses. No additional cases among family members were reported.

On 16 September 2022, the Centers for Disease Control and Prevention (CDC) in the United States of America (USA) announced the detection of two human cases of infection with influenza A(H1N2)v viruses. Both cases were in children less than 18 years of age. One was detected in the state of Michigan and one in Wisconsin. The case in Michigan had exposure to an agricultural fair, mild illness, was not hospitalized and has recovered. Another person in the case's household also attended the same fair and had similar symptoms with onset on the same day as the case. No human-to-human transmission was associated with this event. The events surrounding the case detected in Wisconsin were under investigation.[6]

On 23 September, the US CDC announced the detection of an additional human case of infection with an influenza A(H1N2)v virus in a child less than 18 years of age from the state of Georgia. The case was not hospitalized and has recovered. The case had exposure to swine at an agricultural event before illness onset. No evidence of human-to-human transmission of the virus associated with this case was detected. [7]

[6] US Centers for Disease Control and Prevention. Flu View. Past Weekly Surveillance Reports. Available at: https://www.cdc.gov/flu/weekly/pastreports.htm.
[7] US Centers for Disease Control and Prevention. Flu View. Past Weekly Surveillance Reports. Available at: https://www.cdc.gov/flu/weekly/pastreports.htm.

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.

For more information on A(H5), A(H3N8), A(H7), A(H9N2), A(H10). A(H1)v and A(H3N2)v viruses, see the report from the WHO Consultation and Information Meeting on the Composition of Influenza Virus Vaccines for Use in the 2023 Southern Hemisphere Influenza Season held on 19-23 September 2022 in Dublin, Ireland at the following link: Antigenic and genetic characteristics of zoonotic influenza A viruses and development of candidate vaccine viruses for pandemic preparedness in the 2023 southern hemisphere influenza season.

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 WOAH 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 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).[8] State Parties to the IHR (2005) are required to immediately notify WHO of any laboratory-confirmed[9] case of a recent human infection caused by an influenza A virus with the potential to cause a pandemic[10]. 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**[11] 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
World Organisation of Animal Health (WOAH) web page: Avian Influenza
https://www.woah.org/en/disease/avian-influenza/
Food and Agricultural Organization of the United Nations-Animal Health
https://www.fao.org/animal-health/en/
OFFLU
http://www.offlu.org/

[8] World Health Organization. Case definitions for the four diseases requiring notification in all circumstances under the International Health Regulations (2005).
[9] World Health Organization. Manual for the laboratory diagnosis and virological surveillance of influenza (2011). Available at: https://apps.who.int/iris/handle/10665/44518
[10] 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
[11] 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