Influenza at the human-animal interface
Summary and assessment, from 24 October to 9 December 2020

- **New infections**\(^1\): Since the previous update on 23 October 2020, one human infection with an avian influenza A(H5N1) virus, one human infection with an avian influenza A(H5N6) virus, one human infection with an avian influenza A(H9N2) virus, one human infection with an influenza A(H1N1) variant virus, and one human infection with an influenza A(H1N2) variant virus were reported.\(^2\)
- **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 23 October 2020, one new laboratory-confirmed human case of influenza A(H5N1) virus infection was reported to WHO from Lao People’s Democratic Republic (PDR) on 31 October 2020. The patient is a 1-year-old female resident of Saravane province who had illness onset on 13 October 2020. She was hospitalized on 16 October and discharged on 19 October. A throat swab sample was collected for laboratory testing as part of routine severe acute respiratory infection (SARI) surveillance. The sample was confirmed to be positive for A(H5N1) virus following RT-PCR testing at the National Centre for Laboratory and Epidemiology (NCLE) on 28 October.

Among the close contacts of the patient, one contact developed fever and cough after the onset of illness in the patient. Specimens collected from all household contacts, including the symptomatic contact, were negative for influenza A viruses. There was no travel history of the family 14 days prior to symptom onset in the case. Upon further investigation, there were domestic poultry at the residence. Multiple detections of influenza A(H5N1) in domestic birds in

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\(^1\) For epidemiological and virological features of human infections with animal influenza viruses not reported in this assessment, see the yearly report on human cases of influenza at the human-animal interface published in the Weekly Epidemiological Record. Available at: [www.who.int/wer/en/](http://www.who.int/wer/en/)

\(^2\) Standardization of terminology for the influenza virus variants infecting humans: Update. Available at: [https://www.who.int/influenza/gisrs_laboratory/terminology_variant/en/](https://www.who.int/influenza/gisrs_laboratory/terminology_variant/en/)

\(^3\) World Health Organization. Case definitions for the four diseases requiring notification in all circumstances under the International Health Regulations (2005). Available at: [www.who.int/ihr/Case_Definitions.pdf](http://www.who.int/ihr/Case_Definitions.pdf)
the same province of Lao PDR since August 2020 have been reported to the World Organisation for Animal Health (OIE)."\(^4\)

This is the third human case of avian influenza A(H5N1) virus reported from Lao PDR since 2005; two cases including two deaths were reported in 2007. Since 2003, a total of 862 laboratory-confirmed cases of human infection with avian influenza A(H5N1) virus, including 455 deaths, have been reported to WHO from 17 countries (see Figure 1).

One new laboratory-confirmed human case of influenza A(H5N6) virus infection was reported to WHO. On 1 December 2020, China reported a case in an 81-year-old woman from Jiangsu province, who developed symptoms on 16 November 2020. She was admitted to hospital on 21 November and passed away on the 27 November. The investigation indicated the most likely source of the case’s exposure to the virus was exposure to poultry purchased from a live poultry market. No other cases had been detected among the case’s contacts at the time of reporting.

A total of 25 laboratory-confirmed cases of human infection with influenza A(H5N6) virus have been reported to WHO from China since 2014.

According to reports received by the World Organisation for Animal Health (OIE), various influenza A(H5) subtypes continue to be detected in birds in Africa, Europe and Asia.

**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 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 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 healthcare 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.

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Figure 1: Epidemiological curve of avian influenza A(H5N1) cases in humans by month of onset, 2003-2020.

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

Overall, the risk assessment has not changed.

Avian influenza A(H9N2) viruses
One laboratory-confirmed human case of influenza A(H9N2) virus infection was reported from China to WHO on 18 October 2020 and was not included in the previous update. The infection was detected in a 3-year-old female from Guangdong Province, China, who had exposure to domestic poultry. She developed mild symptoms on 12 October and was admitted to a hospital on the same day. The patient was sampled as part of routine influenza-like illness (ILI) surveillance and no further cases were detected among family members at the time of reporting.

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 follow exposure to the A(H9N2) virus through contact with infected poultry or contaminated environments. Human infection tends to result in mild clinical illness in most cases.

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(H1N1) variant virus (A(H1N1)v)
Since the last risk assessment of 23 October 2020, one human case of infection with a swine influenza A(H1N1)v virus was reported by the Netherlands, which occurred in September 2019. The infection was detected in a 43-year-old male farmer who developed an influenza-like illness on 25 September 2019. Samples were collected from the farmer, another symptomatic farm worker as well as symptomatic pigs at the farm. Influenza A viruses were detected in the samples from the farmer and the pigs. Antigenic and genetic characterization indicated the viruses were Eurasian avian-like influenza A(H1N1) swine influenza viruses. The full genome sequences of the viruses from the farmer and a pooled sample from the pigs were nearly identical. All segments were distant from seasonal human influenza viruses. The farmer went to his general practitioner and recovered uneventfully following treatment for pneumonia. The farmer had no recent travel history, visited no trade fairs and had not bought new animals prior to his illness. Two contacts of the farm worker had influenza-like illness prior to the illness in the farmer but were not sampled. Further details on the virus characterization are anticipated.

Influenza A(H1N2) variant virus (A(H1N2)v)
Since the last risk assessment, one human case of infection with a swine influenza A(H1N2)v virus was reported to WHO from Canada on 31 October 2020. The infection was detected in a child in the province of Alberta who developed an influenza-like illness and received medical care on 7 October 2020 when a sample was collected. On 3 November, the detection of an influenza A(H1N2)v virus was confirmed at the National Microbiology Laboratory (NML), Canada’s National Influenza Centre. The patient has recovered. No further cases were detected among family members, although one sibling of the patient also developed symptoms but was not tested. On preliminary investigation, the case had no known animal exposure; however, the patient’s father provides direct care to animals on a swine farm. There was no recent travel history among any members of the household. This is the first influenza A(H1N2)v virus infection identified in Canada since reporting began in 2005. Other variant virus infections, such as A(H1N1)v and A(H3N2)v have been detected and reported from Canada to WHO in past years.

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 traveler 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 from countries affected by these influenza viruses, refer to OIE guidance.
- WHO advises that travelers 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. Travelers should follow good food safety and good food hygiene practices.
- 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 virus circulation in animals is not clear, epidemiological and virological surveillance and the follow-up of suspected human cases should remain high. Guidance on investigation of non-seasonal influenza and other emerging acute respiratory diseases has been published on the WHO website [www.who.int/influenza/resources/publications/outbreak_investigation_protocol/en/](http://www.who.int/influenza/resources/publications/outbreak_investigation_protocol/en/).
- In the current COVID-19 pandemic, vigilance for the emergence of novel influenza viruses of pandemic potential should be maintained. WHO is developing practical guidance to prepare for the upcoming influenza season and influenza emergencies in the context of the cocirculation of SARS-CoV-2 and influenza viruses.
- All human infections caused by a new subtype of influenza virus are notifiable under the International Health Regulations (IHR, 2005). State Parties to the IHR (2005) are required to immediately notify WHO of any laboratory-confirmed case of a recent human infection caused by an influenza A virus with the potential to cause a pandemic. 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

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6 World Health Organization. Case definitions for the four diseases requiring notification in all circumstances under the International Health Regulations (2005). Available at: [www.who.int/ihr/Case_Definitions.pdf](http://www.who.int/ihr/Case_Definitions.pdf)


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
- WHO Protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases
- Cumulative Number of Confirmed Human Cases of Avian Influenza A(H5N1) Reported to WHO
- Avian Influenza A(H7N9) Information
- WHO Avian Influenza Food Safety Issues
- World Organisation of Animal Health (OIE) web page: Web portal on Avian Influenza
- Food and Agriculture Organization of the UN (FAO) webpage: Avian Influenza
- OFFLU
  [http://www.offlu.net/index.html](http://www.offlu.net/index.html)

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\(^9\) World Health Organization. Operational guidance on sharing influenza viruses with human pandemic potential (IVPP) under the Pandemic Influenza Preparedness (PIP) Framework (2017). Available at: