

Influenza at the human-animal interface

Summary and assessment, 26 January to 2 March 2018

- **New infections¹:** Since the previous update, new human infections with avian influenza A(H7N4), A(H7N9) and A(H9N2) viruses were reported.
- **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. Further human infections with viruses of animal origin are expected.
- **Risk management:** Selection of new candidate vaccine viruses (CVVs) for zoonotic influenza for influenza pandemic preparedness purposes was done during a recent WHO consultation.²
- **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 update on 25 January 2018, no new laboratory-confirmed human cases of influenza A(H5) virus infection were reported to WHO.

Influenza A(H5) subtype viruses have the potential to infect humans and thus far, no human cases, other than those with influenza A(H5N1) and A(H5N6) viruses, have been reported to WHO. 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. Influenza A(H5N6) viruses have recently been detected in parts of Europe and Asia, however these A(H5N6) viruses are different from the A(H5N6) influenza viruses which have infected humans in China.

Avian influenza A(H7N4) virus

Since the last update on 25 January 2018, one laboratory-confirmed human case of influenza A(H7N4) virus infection was reported to WHO. A 68-year-old female resident of Jiangsu province, China, developed symptoms on 25 December 2017. She was hospitalized on 1 January with severe pneumonia and recovered and was discharged on 22 January 2018. The patient had exposure to live poultry before illness onset and influenza A(H7N4) viruses were also detected in birds in her

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/

² World Health Organization. Antigenic and genetic characteristics of zoonotic influenza viruses and candidate vaccine viruses developed for potential use in human vaccines. Available at: www.who.int/influenza/vaccines/virus/characteristics_virus_vaccines/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

backyard. No further human cases were reported among her close contacts. Genetic sequencing of the virus indicated that all segments are closely related to wild bird avian influenza viruses and that the haemagglutinin (HA) gene is distinct from that of the influenza A(H7N9) viruses that have infected humans in China. Additional information on the virus was reported in the recent WHO consultation on zoonotic influenza viruses.²

Risk Assessment:

1. What is the overall risk of additional human cases of infection with A(H7N4) influenza viruses being detected? Avian influenza viruses circulate worldwide. Depending on geographic location and subtype, the genetic characteristics of these viruses differ. Most of the detected human cases of infection with avian influenza viruses are exposed to avian influenza viruses through contact with infected birds or contaminated environments. Since avian influenza viruses continue to circulate in birds, further human cases would be likely. The public health impact should this occur is minor. Since the epidemiology of this specific virus in animals is unknown, the confidence in this assessment is low.

2. What is the risk of sustained human-to-human transmission of A(H7N4) influenza viruses? Current evidence suggests that this virus does not have the ability of sustained transmission among humans, thus the likelihood is low, however the public health impact should this occur would be major. Since little information on this virus is currently available, the confidence in this assessment is low.

3. What is the risk of international spread of A(H7N4) influenza viruses by travellers? Should infected individuals from affected areas travel internationally, their infection may be detected and the public health impact if this were to occur would be minor. Further community-level spread is considered unlikely as this virus has not acquired the ability to transmit easily among humans. However, if this were to occur, the public health impact would be major.

Avian influenza A(H7N9) viruses

Since the last update on 25 January 2018, one new laboratory-confirmed human case of influenza A(H7N9) virus infection was reported to WHO. A 59-year-old female resident of Guangdong province, China, developed symptoms on 3 February. She was hospitalized on 6 February with severe pneumonia. The patient had exposure to live poultry before illness onset; no further human cases were reported among her close contacts. Additional information on the virus from the case is anticipated.

Since 2013, a total of 1567 laboratory-confirmed cases of human infection with avian influenza A(H7N9) viruses, including at least 615 deaths⁴, have been reported to WHO (Figure 1). If the incidence of human cases follows the trends seen in previous years, the number of reported human cases may rise over the coming months. Further sporadic cases of human infection with avian influenza A(H7N9) virus are therefore expected in affected and possibly neighbouring areas.

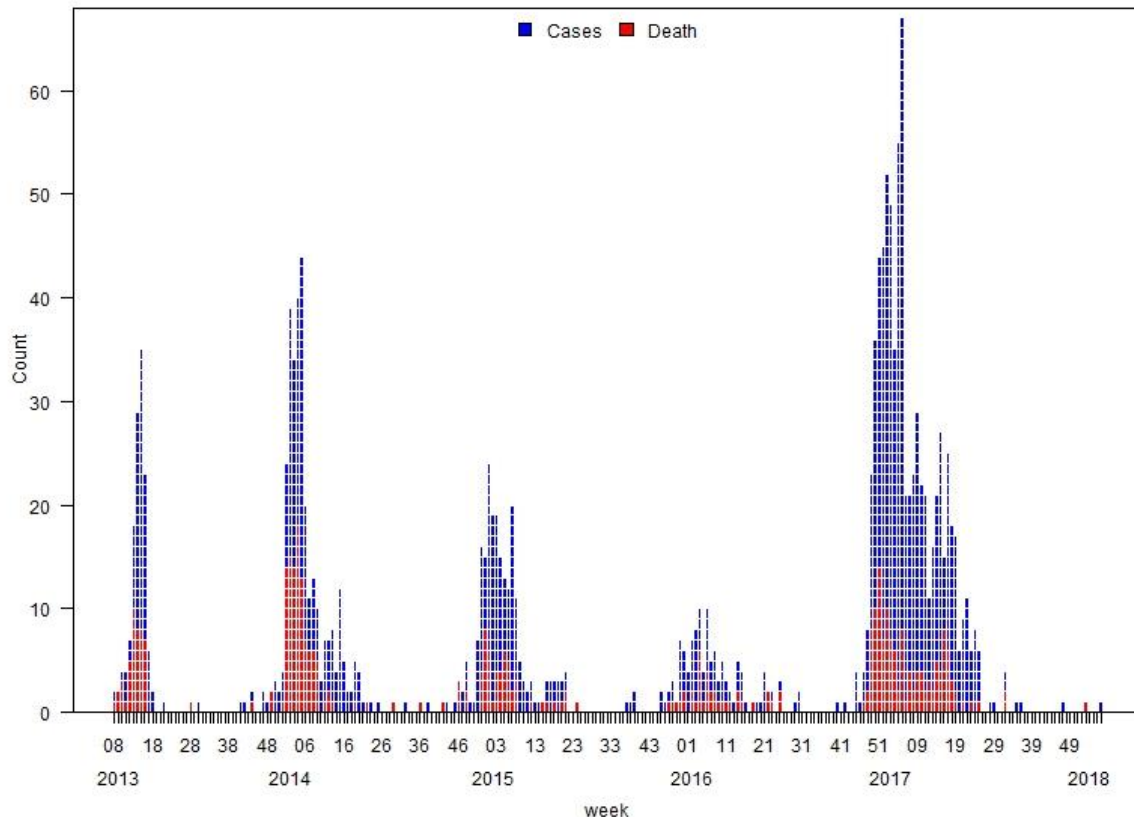
The agricultural authorities in China have announced that vaccination of domestic poultry against infection with avian influenza A(H7) viruses has commenced, in addition to the ongoing poultry vaccination program against avian influenza A(H5) viruses.⁵

Overall, the risk assessment has not changed.

⁴ Total number of fatal cases is published on a monthly basis by China National Health and Family Planning Commission. Total number of deaths in mainland China was updated at the VCM in February 2018.

⁵ H7N9 Situation Update, FAO. Available at: www.fao.org/ag/againfo/programmes/en/empres/H7N9/Situation_update.html

Figure 1: Epidemiological curve of avian influenza A(H7N9) cases in humans by week of onset, 2013-2018.



Risk Assessment:

1. What is the likelihood that additional human cases of infection with avian influenza A(H7N9) viruses will occur?

Most human cases are exposed to the A(H7N9) virus through contact with infected poultry or contaminated environments, including live poultry markets. Since the virus likely continues to circulate in animals and environments, further human cases can be expected. Additional sporadic human cases of influenza A(H7N9) in other provinces in China that have not yet reported human cases are also expected.

2. What is the likelihood of human-to-human transmission of avian influenza A(H7N9) viruses?

Even though small clusters of cases have been reported, including those involving healthcare workers, currently available epidemiological and virological evidence suggests that this virus has 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(H7N9) virus 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 this virus has not acquired the ability to transmit easily among humans.

Avian influenza A(H9N2) viruses

Since the last update on 25 January 2018, three laboratory-confirmed human cases of A(H9N2) virus infection were reported to WHO from China. Case details are presented in the table in the Annex of this document. Avian influenza A(H9N2) viruses are enzootic in poultry in China.

Risk Assessment:

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

Most human cases are exposed to the A(H9N2) virus through contact with infected poultry or contaminated environments. Human infection tends to result in mild clinical illness. 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 epidemiological and virological evidence suggests that this virus has 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 this virus has 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 regard 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 faeces. 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 virological, epidemiological and clinical changes associated with circulating influenza viruses that may affect human (or animal) health, especially over the coming winter months. 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.
- 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 pandemic. Evidence of illness is not required for this report.
- It is critical that influenza viruses from animals and 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 their influenza viruses with pandemic potential on a regular and timely basis with the Global Influenza Surveillance and Response System (GISRS), a WHO-coordinated network of public health laboratories. The viruses

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

⁷ World Health Organization. Manual for the laboratory diagnosis and virological surveillance of influenza (2011). Available at: www.who.int/influenza/gisrs_laboratory/manual_diagnosis_surveillance_influenza/en/

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

http://www.who.int/influenza/human_animal_interface/en/

Cumulative Number of Confirmed Human Cases of Avian Influenza A(H5N1) Reported to WHO

http://www.who.int/influenza/human_animal_interface/H5N1_cumulative_table_archives/en/

Avian Influenza A(H7N9) Information

http://who.int/influenza/human_animal_interface/influenza_h7n9/en/index.html

WHO Avian Influenza Food Safety Issues

http://www.who.int/foodsafety/areas_work/zoonose/avian/en/

World Organisation of Animal Health (OIE) web page: Web portal on Avian Influenza

<http://www.oie.int/animal-health-in-the-world/web-portal-on-avian-influenza/>

Food and Agriculture Organization of the UN (FAO) webpage: Avian Influenza

<http://www.fao.org/avianflu/en/index.html>

OFFLU

<http://www.offlu.net/index.html>

Annex:

Table 1: Laboratory-confirmed human cases of avian influenza A(H9N2) virus infection (reported 2 March 2018)

Province or region reporting (province of assumed exposure, if different from reporting province or region)	Age	Sex	Case condition at time of reporting	Date of onset (dd/mm/yyyy)	Exposure history (at time of reporting)
Anhui	9	F	Mild	29/12/2017	Unknown
Guangdong	3	F	Mild	21/01/2018	Live poultry market
Beijing	51	F	Mild	13/02/2018	Slaughtered domestic poultry