

Influenza at the human-animal interface

Summary and assessment, 28 September to 30 October 2017

- **New infections¹:** Since the previous update, new human infections with influenza A(H1N2)v and A(H3N2)v variant² 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.
- **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 animal and non-circulating seasonal influenza viruses. 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 27 September, no new laboratory-confirmed human cases of influenza A(H5N1) virus infection were reported to WHO.

Since 2003, a total of 860 laboratory-confirmed cases of human infection with avian influenza A(H5N1) virus, including 454 deaths, have been reported to WHO from 16 countries.⁴

Influenza A(H5) subtype viruses have the potential to cause disease in 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.

Avian influenza A(H7N9) viruses

Since the last update on 27 September, no new laboratory-confirmed human cases of influenza A(H7N9) virus infection were reported to WHO.

Since 2013, a total of 1564 laboratory-confirmed cases of human infection with avian influenza A(H7N9) viruses, including at least 612 deaths⁵, have been reported to WHO. If the incidence of human cases follows the trends seen in previous years, the number of reported human cases may

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. Standardization of terminology for the influenza virus variants infecting humans: Update. Available at: 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

⁴ WHO Cumulative number of confirmed human cases of avian influenza A(H5N1) reported to WHO tables. Available at: www.who.int/influenza/human_animal_interface/H5N1_cumulative_table_archives/en/

⁵ Total number of fatal cases is published on a monthly basis by China National Health and Family Planning Commission.

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.

According to reports received by the Food and Agriculture Organization (FAO) on surveillance activities for avian influenza A(H7N9) viruses in China, positives among virological samples continue to be detected in poultry from live bird markets, commercial and backyard farms. 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.

Information from a recent publication on influenza A(H7N9) virus transmission was considered during this risk assessment.⁶ The publication presents new information on one of the highly pathogenic (HP) avian influenza A(H7N9) viruses which emerged in late 2016-early 2017. The study confirms that like the low pathogenic (LP) avian influenza A(H7N9) viruses, this HP influenza A(H7N9) virus can transmit via respiratory droplets between ferrets. Vaccine viruses are being developed by the Global Influenza Surveillance and Response System (GISRS) to cover this and other potentially similar HP A(H7N9) viruses.⁷ The latest antigenic and genetic characterization of zoonotic influenza viruses can be found [here](#).

Overall, the risk assessment has not changed. The influenza A(H7N9) viruses have not exhibited sustained human-to-human transmission since their emergence in 2013 and no significant changes in the virus properties or the epidemiology of human infections have been observed. Rapid sharing of information and viruses is essential to detect emerging changes and conduct rapid risk assessment with increased confidence. WHO, through GISRS, and in collaboration with the OIE-FAO Network of Experts on Animal Influenza (OFFLU), research and academic institutions and national authorities, will continue monitoring the A(H7N9) virus situation very closely. WHO will continue to reach out to partners and reassess the risk as new information becomes available.

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 continues to be detected 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 risk 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.

⁶ Imai M, Watanabe T, Kiso M, Nakajima N, Yamayoshi S, Iwatsuki-Horimoto K et al. A Highly Pathogenic Avian H7N9 Influenza Virus Isolated from A Human Is Lethal in Some Ferrets Infected via Respiratory Droplets. *Cell Host and Microbe*. 2017; 19 Oct. doi.org/10.1016/j.chom.2017.09.008.

⁷ World Health Organization. Antigenic and genetic characteristics of zoonotic influenza viruses and development of candidate vaccine viruses for pandemic preparedness, February 2017. Available at: http://www.who.int/influenza/vaccines/virus/201703_zoonotic_vaccinevirusupdate.pdf?ua=1

Swine Influenza Viruses

Current situation:

Influenza A(H1N2)v viruses

One new laboratory-confirmed human infection with influenza A(H1N2)v viruses was detected in the state of Ohio in the United States (U.S). The case occurred in a child who reported contact with swine at an agricultural event prior to illness. The case was not hospitalized and has fully recovered. No human-to-human transmission was identified. Characterization of the virus from the case indicates it is similar to A(H1N2)v viruses previously detected and similar to the existing candidate vaccine virus.

Since 2005, 12 cases of A(H1N2)v influenza virus infection have been reported to the U.S. Centers for Disease Control and Prevention (CDC).⁸ Most cases are associated with mild illness and two have been hospitalized.

Influenza A(H3N2)v viruses

Since 27 September 2017, 41 human infections with influenza A(H3N2)v viruses were detected in the U.S. in several states.⁹ All cases reported exposure to swine at an agricultural fair before illness onset. Two cases were hospitalized and all were recovering or have recovered at the time of reporting. No human-to-human transmission was identified. Characterization of the viruses from these cases indicates they are similar to A(H3N2)v viruses previously detected and similar to the existing candidate vaccine virus.

Since reporting of novel influenza A viruses became nationally notifiable in 2005, 462 human infections with influenza A(H3N2)v viruses have been reported to the U.S. CDC and 59 of these occurred in 2017.⁶

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 swine or contaminated environments. Human infection tends to result in mild clinical illness. 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? No case clusters have been reported. 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 risk 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.

⁸ Centers for Disease Control and Prevention, USA. Reported Infections with Variant Influenza Viruses in the United States since 2005. Available at: <https://www.cdc.gov/flu/swineflu/variant-cases-us.htm>.

⁹ Centers for Disease Control and Prevention, USA. Weekly U.S. Influenza Surveillance Report. Available at: www.cdc.gov/flu/weekly/index.htm

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 and 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 influenza subtype are notifiable under the International Health Regulations (IHR, 2005).¹⁰ State Parties to the IHR (2005) are required to immediately notify WHO of any laboratory-confirmed¹¹ case of a recent human infection caused by an influenza A virus with the potential to cause a pandemic.⁶ 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 and reported according to international standards. 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 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>

¹⁰ 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

¹¹ 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/