

## Influenza at the human-animal interface

Summary and assessment, 8 December 2017 to 25 January 2018

- **New infections<sup>1</sup>:** Since the previous update, new human infections with avian influenza A(H5N6) and A(H7N9) viruses, and influenza A(H1N1)v and A(H3N2)v<sup>2</sup> 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).<sup>3</sup> This includes any influenza A virus that has demonstrated the capacity to infect a human and its hemagglutinin 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 7 December 2017, one new laboratory-confirmed human case of influenza A(H5N6) virus infection was reported to WHO.

A 3-year-old female resident of Fujian Province, China, developed symptoms on 19 December 2017. She was diagnosed and treated as an outpatient and has recovered. 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.

A total of 19 laboratory-confirmed cases of human infection with influenza A(H5N6) virus, including six deaths, have been reported to WHO from China since 2014.<sup>4</sup>

According to the animal health authorities in China<sup>5,6</sup>, influenza A(H5N6) viruses have been detected in poultry in the first half of 2017 in many provinces in the country, including those that have reported human cases. 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

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<sup>1</sup> 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/)

<sup>2</sup> 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/](http://www.who.int/influenza/gisrs_laboratory/terminology_variant/en/)

<sup>3</sup> 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)

<sup>4</sup> Since the last update on 7 December 2017, an additional human case of infection with an influenza A(H5N6) virus was included in the count of laboratory-confirmed cases reported to WHO from China. This case occurred in 2015.

<sup>5</sup> <http://www.moa.gov.cn/zwl/m/tzgg/gb/sygb/>

<sup>6</sup> [http://www.oie.int/wahis\\_2/public/wahid.php/Reviewreport/Review?page\\_refer=MapFullEventReport&reportid=19897](http://www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=19897)

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.

#### **Risk Assessment:**

- 1. What is the likelihood that additional human cases of infection with avian influenza A(H5) viruses will occur?** 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 this and other A(H5) 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 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.

#### **Avian influenza A(H7N9) viruses**

Since the last update on 7 December 2017, one new laboratory-confirmed human case of influenza A(H7N9) virus infection was reported to WHO. A 72-year-old male resident of Xinjiang Uyghur Autonomous Region, China, developed symptoms on 3 January. He was hospitalized on 6 January and passed away on 10 January 2018. The patient had exposure to a live poultry market before illness onset; no further human cases were reported among his close contacts. Additional information on the virus from the case is anticipated.

Since 2013, a total of 1566 laboratory-confirmed cases of human infection with avian influenza A(H7N9) viruses, including at least 613 deaths<sup>7</sup>, 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.<sup>8</sup>

Overall, the risk assessment has not changed.

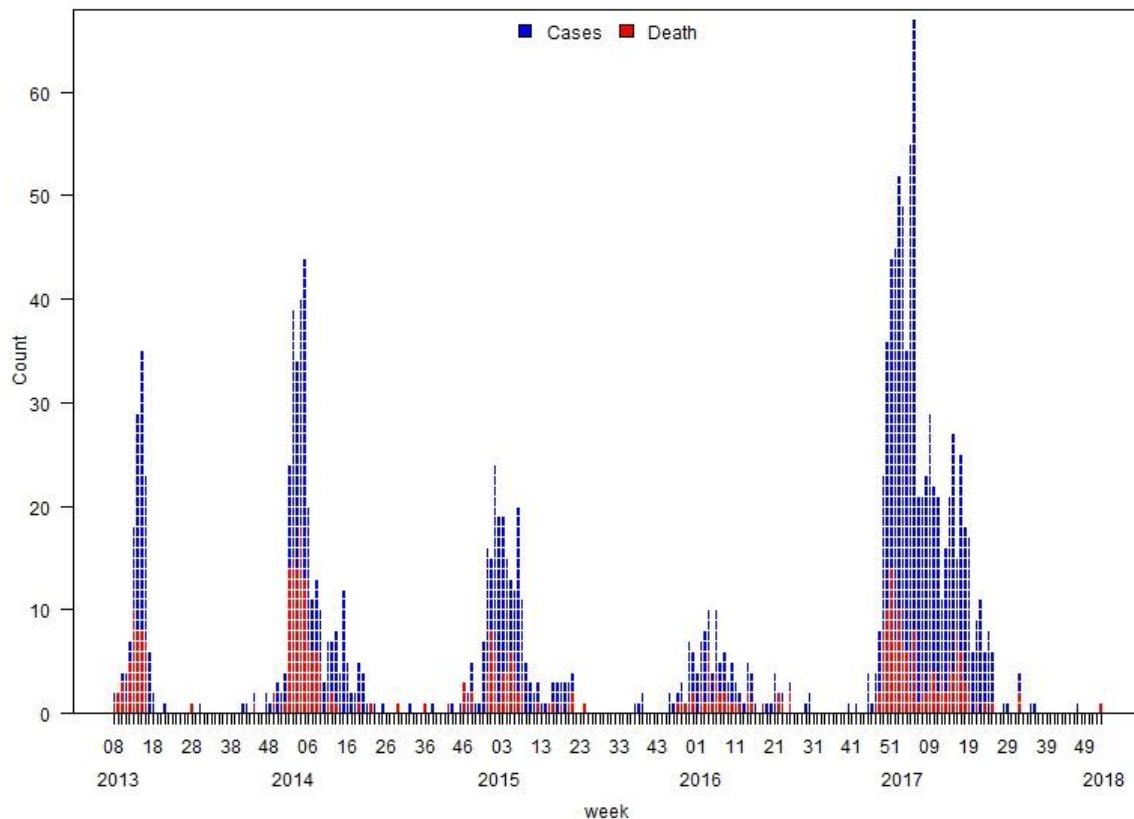
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<sup>7</sup> Total number of fatal cases is published on a monthly basis by China National Health and Family Planning Commission.

<sup>8</sup> H7N9 Situation Update, FAO. Available at:

[www.fao.org/ag/againfo/programmes/en/empres/H7N9/Situation\\_update.html](http://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.

**Swine Influenza Viruses**

**Current situation:**

**Influenza A(H1N1)v viruses**

On 16 January 2018, Switzerland informed WHO of a case of human infection with a swine influenza A(H1N1)v virus. The case is a male farm worker, aged 48, living in Switzerland. On 20 December

2017, he presented with mild acute respiratory symptoms 8 days before a nasal swab was collected. The virus isolated from this human case was partially sequenced and was closely related to the European avian-like swine influenza A(H1N1) viruses circulating in swine in Europe. Samples from the swine at the farm where the case worked also tested positive for influenza A viruses, and are currently under characterization. No additional human cases related to this event were reported. Human cases infected with swine influenza viruses have been detected in Switzerland in 2003, 2009, 2010, 2011 and 2016. Swine influenza A(H1N1) viruses are endemic in pig populations and circulate among swine in many regions of the world.

### **Influenza A(H3N2)v viruses**

Since the last update on 7 December 2017, one human infection with an influenza A(H3N2)v virus was reported in the U.S. in the state of Iowa.<sup>9</sup> The case reported contact with swine in the week prior to illness onset. The case was not hospitalized and has fully recovered, and no human-to-human transmission was identified.

Since human infections with novel influenza A viruses became nationally notifiable in 2005, 434 human infections with influenza A(H3N2)v viruses have been reported to the U.S. CDC and 62 of these occurred in 2017.<sup>6</sup> Most cases are associated with mild illness, although several cases have been hospitalized and one case was reported as a fatal case (in 2012). Swine influenza A(H3N2) viruses are endemic in pig populations and circulate among swine in many regions of the world.

### **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?** Although limited human-to-human transmission may have taken place, 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 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.

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<sup>9</sup> Centers for Disease Control and Prevention, USA. Weekly U.S. Influenza Surveillance Report. Available at: [www.cdc.gov/flu/weekly/index.htm](http://www.cdc.gov/flu/weekly/index.htm)

- 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).<sup>10</sup> State Parties to the IHR (2005) are required to immediately notify WHO of any laboratory-confirmed<sup>11</sup> 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 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/](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/](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](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/](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>

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<sup>10</sup> 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)

<sup>11</sup> 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/](http://www.who.int/influenza/gisrs_laboratory/manual_diagnosis_surveillance_influenza/en/)