

## Influenza at the human-animal interface

Summary and assessment, 16 June 2017 to 25 July 2017

- **New infections<sup>1</sup>:** Since the previous update, new human infections with influenza A(H7N9), A(H9N2) and A(H3N2) variant<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 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

#### Avian influenza A(H5) viruses

##### Current situation:

Since the last update on 15 June 2017, no new laboratory-confirmed human cases of influenza A(H5N1) virus infection were reported to WHO. Since 2003, a total of 859 laboratory-confirmed cases of human infection with avian influenza A(H5N1) virus, including 453 deaths, have been reported to WHO from 16 countries.<sup>4</sup>

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

##### Current situation:

During this reporting period, 24 laboratory-confirmed human cases of influenza A(H7N9) virus infection were reported to WHO from China. Cases were reported with likely exposure in Yunnan

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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/)

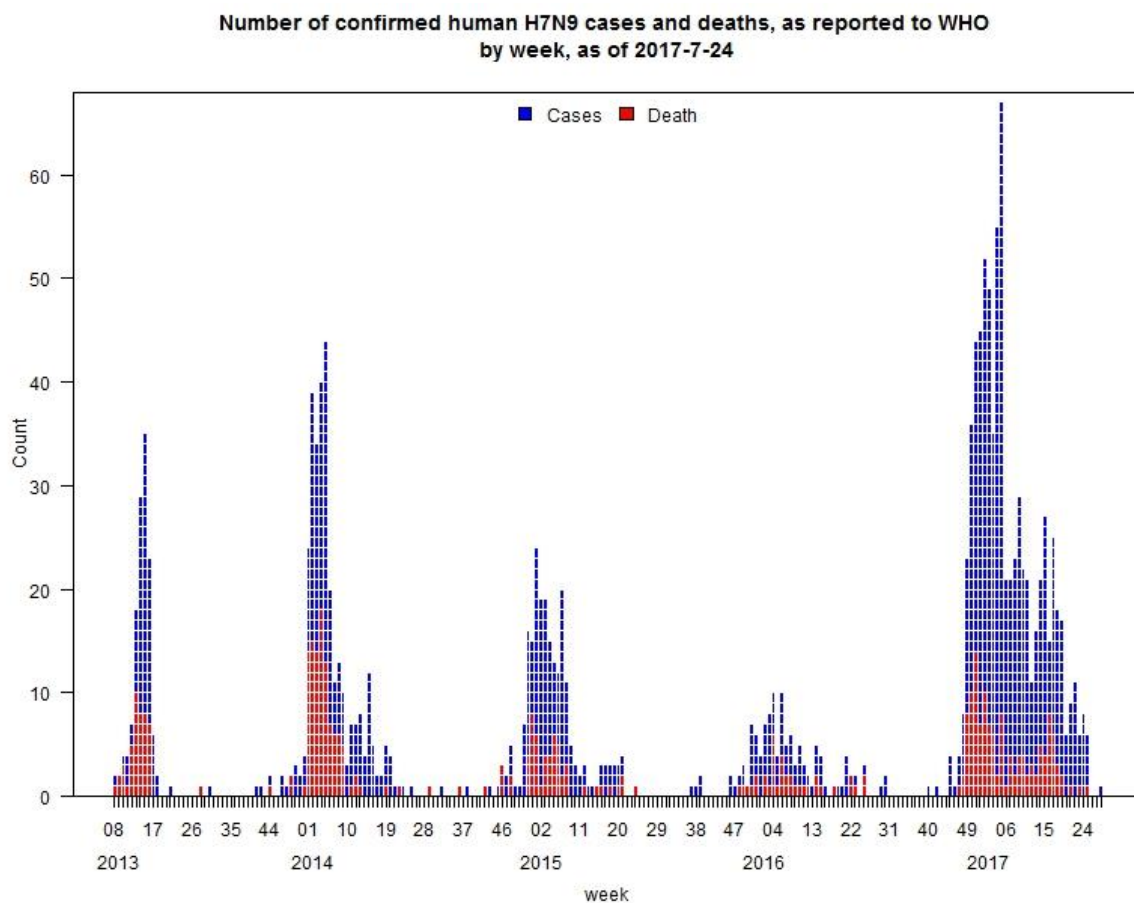
<sup>3</sup> World Health Organization. Case definitions for the four diseases requiring notification in all circumstances under the International Health Regulations (2005). Available at: [www.who.int/ihr/Case\\_Definitions.pdf](http://www.who.int/ihr/Case_Definitions.pdf)

<sup>4</sup> 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/](http://www.who.int/influenza/human_animal_interface/H5N1_cumulative_table_archives/en/)

province for the first time. Case and cluster details are presented in the table in the Annex of this document. For additional details on these cases, public health interventions, and the highly pathogenic avian influenza (HPAI) A(H7N9) viruses, see the [Disease Outbreak News](#).

As of 25 July 2017, a total of 1557 laboratory-confirmed cases of human infection with avian influenza A(H7N9) viruses, including at least 605 deaths<sup>5</sup>, have been reported to WHO (Figure 1). The number of human infections with avian influenza A(H7N9) viruses and the geographical distribution of human cases in the fifth epidemic wave (i.e. onset since 1 October 2016) have been greater than in any earlier wave. This suggests that the virus has spread, and emphasizes that further intensive surveillance and control measures in both the human and animal health sectors are crucial. However, the number of reported confirmed cases has continued to decline over the past few weeks with only one case reported thus far with an onset of illness after 23 June 2017.

**Figure 1: Epidemiological curve of avian influenza A(H7N9) cases in humans by week of onset, 2013-2017**



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

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

authorities in China have also announced plans to commence vaccination of domestic poultry nation-wide against infection with avian influenza A(H7) viruses beginning in September 2017.<sup>6</sup>

#### **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 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.

#### **Avian influenza A(H9N2) viruses**

##### **Current situation:**

On 30 June 2017, one case of human infection with avian influenza A(H9N2) virus was reported to WHO from China in a 2-month old female child who lives in Guangdong Province, China. She had onset of influenza-like illness (ILI) on 28 April 2017. The patient was hospitalized on 9 June. A sample collected from the patient on 13 June as part of ILI surveillance was laboratory-confirmed as positive for A(H9N2) influenza virus on 16 June. The patient was exposed to backyard poultry prior to illness. The case has fully recovered.

##### **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. 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.

**What is the risk 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

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<sup>6</sup> Food and Agriculture Organization. H7N9 situation update. 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)

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.

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

On 28 July 2017, the United States announced the lab confirmation of 11 human cases of infection with A(H3N2)v viruses in Ohio.<sup>7</sup> All cases reported exposure to swine at an agricultural fair before illness onset. All but one of the cases were under 10 years of age, none were hospitalized and all recovered. Human-to-human transmission of the viruses was unlikely in this event. Further characterization of the viruses is underway. The first case of human infection with an influenza A(H3N2)v virus in 2017 was reported in a child from the state of Texas in May.<sup>8</sup>

Since reporting of novel influenza A viruses became nationally notifiable in 2005, 384 human infections with influenza A(H3N2)v viruses have been reported to the U.S. CDC.<sup>9</sup>

### **Risk Assessment:**

- 1. What is the likelihood that additional human cases of infection with swine influenza viruses will occur?** Influenza A(H3N2) 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 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 these viruses have not acquired the ability to transmit easily among humans.

### **Overall Risk Management Recommendations:**

- WHO does not advise special traveller 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 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

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<sup>7</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)

<sup>8</sup> World Health Organization. Influenza at the human-animal interface Summary and assessment, 21 April to 16 May 2017. Available at: [www.who.int/influenza/human\\_animal\\_interface/Influenza\\_Summary\\_IRA\\_HA\\_interface\\_05\\_16\\_2017.pdf?ua=1](http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_05_16_2017.pdf?ua=1)

<sup>9</sup> Centers for Disease Control and Prevention, USA. Reported Infections with Variant Influenza Viruses in the United States since 2005. Available at: [www.cdc.gov/flu/swineflu/variant-cases-us.htm](http://www.cdc.gov/flu/swineflu/variant-cases-us.htm)

slaughtered, or contact with any surfaces that appear to be contaminated with animal faeces. Travellers should also wash their hands often with soap and water. Travellers 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. Continued vigilance is needed within affected and neighbouring areas to detect infections in animals and humans. 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).<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.<sup>6</sup> 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/](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/)

Annex:

**Table 1: Laboratory-confirmed human cases of avian influenza A(H7N9) virus infection (reported from 16 June to 25 July 2017)**

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)
Guangxi	55	M	Fatal	06/06/2017	No known exposure
Zhejiang	67	F	Severe	01/06/2017	Domestic poultry
Hunan	41	M	Severe	01/06/2017	Occupational exposure to live poultry
Beijing (Hebei)	54	M	Severe	25/04/2017	No known exposure
Guizhou	68	M	Severe	05/06/2017	Live poultry market
Inner Mongolia	50	M	NR	05/06/2017	Domestic poultry
Hebei	71	M	Fatal	10/06/2017	No known exposure
Beijing (Hebei)	31	M	NR	10/06/2017	Domestic poultry
Anhui	61	M	Severe	17/06/2017	Live poultry market
Sichuan	48	M	Severe	07/06/2017	Live poultry market vendor
Sichuan	79	M	Fatal	12/06/2017	Live poultry market
Guizhou	33	M	NR	19/06/2017	Live poultry vendor
Tianjin	61	M	NR	12/06/2017	Domestic poultry
Beijing (Hebei)	41	M	Severe	12/06/2017	Domestic poultry
Jiangsu (Anhui)	42	M	Severe	11/06/2017	Live poultry market
Yunnan	27	M	NR	11/06/2017	Live poultry market
Yunnan	4	F	Mild	11/06/2017	Live poultry market
Yunnan	42	F	Mild	21/06/2017	Live poultry market; visited sister-in-law (33, F case below) in hospital before illness onset.
Yunnan	33	F	Severe	17/06/2017	No known exposure; sister-in-law of above case (42, F)
Guizhou	45	M	Severe	23/06/2017	Live poultry market
Shanxi	72	M	Severe	22/06/2017	Domestic poultry
Xinjiang	35	M	Fatal	23/06/2017	Live poultry market vendor
Yunnan	54	M	Severe	23/06/2017	Live poultry market
Jiangsu	62	F	Severe	12/07/2017	Live poultry market

NR: not reported