Influenza at the human-animal interface
Summary and assessment, 26 January to 2 March 2018

- **New infections**: 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.
- **IHR compliance**: All human infections caused by a new influenza subtype are required to be reported under the International Health Regulations (IHR, 2005). 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

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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/)


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)
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 515 deaths\(^4\), 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.

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\(^2\) 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.
\(^4\) H7N9 Situation Update, FAO. Available at:
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). 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 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

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

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

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