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## **H7N9 Avian Influenza**

28 March 2014

### **Important information for Hospital Practitioners and Laboratories**

**Summary:** Between April 2013 and 28 January 2014, 365 cases of H7N9 avian influenza, including 116 deaths, have been reported in China (including Hong Kong), Taiwan and Malaysia. So far there have been 229 sporadic cases in a 'second wave' of human H7N9 avian influenza infections with onset since 1 October 2013. Although the environmental source has not yet been definitively determined, some of the confirmed cases have been associated with contact with chickens or poultry or an animal "wet market" environment.

**Chinese New Year:** Chinese New Year is celebrated in January and February of each year. During the latter part of January and the month of February the number of incoming passengers to Australia from China rises substantially. With the anticipated increase in incoming passengers during this period and the recent steady increase of confirmed H7N9 avian influenza cases since 1 January 2014, there is a possibility of cases of H7N9 avian influenza presenting in Australia.

**In patients with pneumonia and a history of travel to, or residence in China within 7 days of illness onset, or contact with known confirmed or probable cases, the following is recommended:**

- 1. Place the patient in a single room with negative pressure air-handling, or a single room from which the air does not circulate to other areas, and implement standard and transmission-based precautions (contact and airborne), including the use of personal protective equipment (PPE). If a negative pressure room or a room with an isolated air handling system is not available, a single room with the door closed should be used.**
- 2. Investigate and manage the patient as for community acquired pneumonia. Appropriate specimens should also be collected for influenza PCR testing.**
- 3. Notify any suspected, probable or confirmed cases promptly to your local public health authorities.**
- 4. Arrange testing of any suspected or probable cases (see case definition) in accordance with the instructions below.**

#### **What is the H7N9 avian influenza?**

Influenza (A)H7 viruses are a group of influenza viruses that normally circulate among birds. H7N9 avian influenza is a reassortant derived from three different avian influenza viruses. This



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strain is distinct from the H1N1/09 (that caused the 2009 pandemic in humans) and H5N1 influenza. H7N9 avian influenza, that is genetically similar to that detected in infected humans, has been detected in pigeon and poultry samples collected at a live animal market in Shanghai. Unlike other influenza strains, including highly pathogenic avian influenza H5N1, this new virus is hard to detect in poultry because this novel virus causes little to no signs of disease in animals.

Although there is no evidence of human-to-human transmission of H7N9 avian influenza to date, laboratory studies indicate that the virus has the capacity to infect mammalian cells; therefore, the potential for avian-human and human-human transmission exists but requires further investigation. Sequences previously associated with high virulence of A(H7) in humans (PB2 gene) have been detected in isolates in the current outbreak.

#### **What is the current situation?**

See WHO website on the current situation, including epidemiological updates, Q&A and guidance documents:

[Disease Outbreak News](http://www.who.int/csr/don/en/index.html) (<http://www.who.int/csr/don/en/index.html>)

[Influenza at the Human-Animal Interface](http://www.who.int/influenza/human_animal_interface/en)

([http://www.who.int/influenza/human\\_animal\\_interface/en](http://www.who.int/influenza/human_animal_interface/en))

- A total of 365 cases have been reported including 116 deaths. To date cases have been reported from 13 provinces/municipalities in eastern of China (Shanghai, Anhui, Jiangsu, Zhejiang, Fujian, Beijing, Guangdong, Henan, Shandong, Hebei, Hunan, Guizhou and Jaingxi), Hong Kong, Taiwan and Malaysia.
- There continues to be no evidence of human-to-human transmission. Only a few small clusters with possible human-to-human transmission have occurred among family members.
- As of 25 February 2014, the case fatality rate of all confirmed cases is 32%, but many are still hospitalized. Of all cases, 67% were male. The median age of reported cases is 59 years and that of fatal cases is 64 years.
- The incubation period is 3 to 4 days.
- There is currently no vaccine available for H7N9 avian influenza. Laboratory testing conducted in China has shown that the H7N9 avian influenza viruses are sensitive to neuraminidase inhibitors (oseltamivir and zanamivir). When these drugs are given early in the course of illness, they have been found to be effective against seasonal influenza virus and influenza A(H5N1) virus infection. However, at this time, there is no experience with the use of these drugs for the treatment of H7N9 avian influenza virus infection.



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- From 1996 to 2012, human infections with H7 influenza viruses (H7N2, H7N3, and H7N7) were reported in Netherlands, Italy, Canada, USA, Mexico and the United Kingdom. Most of these infections occurred in association with poultry outbreaks.

#### **What are the symptoms?**

H7N9 avian influenza was initially identified in patients with pneumonia and/or Acute Respiratory Distress Syndrome (ARDS). Subsequent studies have indicated that, similar to seasonal influenza strains, H7N9 avian influenza has a wide disease spectrum from asymptomatic through to lethal. Common symptoms include fever  $\geq 38^{\circ}\text{C}$ , cough and shortness of breath.

Symptoms and signs of A(H7) infections during previous outbreaks mainly resulted in conjunctivitis and mild upper respiratory symptoms, with the exception of one death, which occurred in the Netherlands.

#### **Are health workers at risk from H7N9 avian influenza?**

The routes of transmission to humans of H7N9 avian influenza have not yet been fully determined, but there is currently no evidence that this strain can spread from human to human. Infection control recommendations in this document for suspected, probable and confirmed cases aim to provide the highest level of protection for health care workers, given the current limited state of knowledge.

#### **Has WHO recommended any travel or trade restrictions related to this new virus?**

The number of cases identified in China increasing, but still relatively low. WHO does not advise the application of any travel measures with respect to visitors to China, nor to persons leaving China. There is no evidence to link the current cases with any Chinese products. WHO advises against any restrictions to trade at this time.

#### **Who do I test for H7N9 avian influenza?**

Testing should be considered for:

1. Individuals with pneumonia and history of travel to, or residence in China within 7 days of symptom onset.
2. Individuals with pneumonia and history of contact with those in point 1 above.
3. Health care workers with pneumonia, who have been caring for patients with severe acute respiratory infections, particularly patients requiring intensive care, without regard to place of residence or history of travel.

#### **How do I test for H7N9 avian influenza?**



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- Where H7N9 avian influenza infection is suspected, samples should be referred to the jurisdictional influenza reference laboratory for testing. Specimens can be handled and transported routinely. They should be clearly identified as requiring urgent testing for H7N9 avian influenza, and separated from non-urgent specimens. The reference laboratory should be notified.
- Collect combined nose and throat swabs (usually from adults) or nasopharyngeal aspirates (usually from children) and place in viral transport medium. Sputum is strongly recommended wherever possible. Bronchoalveolar samples and lung biopsy should also be sent if available.
- Gloves, gown, P2 mask and eye protection should be worn when collecting samples from patients. If a negative pressure room is unavailable, the patient should be placed in a single room with the door closed.
- Testing for other infectious causes can be undertaken at the referring laboratory using PC2 precautions, processing of samples in a biosafety cabinet and use of PPE including a surgical mask and eye protection. Laboratory investigations for suspected H7N9 avian influenza pneumonia should be performed as per local protocols and may include bacterial culture, serology, urinary antigen testing and specific tests for influenza viruses.
- The laboratory carrying out the influenza testing should immediately refer all unsubtypeable or presumptive H7 influenza A virus to one of the National Influenza Centres or the WHOCC in Melbourne.
- Laboratory staff should handle specimens under enhanced PC2 conditions, with handling of open samples in a biosafety cabinet and the use of gloves, gowns, masks and eye protection. PC3 conditions are required for virus culture.
- Details about specimen collection and testing specific to your jurisdiction should be obtained from your local public health unit or Public Health Laboratory director.

#### **What are the recommended isolation and PPE recommendations for patients in hospital?**

While further information is accumulating, current recommendations are for airborne transmission precautions for suspected, probable or confirmed cases.

These recommendations on isolation and PPE for suspected, probable and confirmed cases take a deliberately cautious approach by recommending measures that aim to control the transmission of pathogens that can be spread by the airborne route. These measures are detailed in [NHMRC: Australian Guidelines for the Prevention and Control of Infection in Healthcare – 2010](http://www.nhmrc.gov.au/guidelines/publications/cd33) (<http://www.nhmrc.gov.au/guidelines/publications/cd33> )(particularly section B2.4).



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In summary, transmission-based precautions for suspected, probable and confirmed cases should include:

- Placement of cases in a negative pressure room if available, or in a single room from which the air does not circulate to other areas. If either of these rooms is not available, use a single room with the door closed.
- Airborne transmission precautions, including routine use of a P2 respirator, disposable gown, gloves, and eye protection when entering a patient care area
- Standard and contact precautions, including close attention to hand hygiene
- If a single or negative pressure room is not available (eg in primary care settings), or if transfer of the confirmed or probable case outside the negative pressure room is necessary, asking the patient to wear a surgical face mask, if tolerated, while they are being transferred and to follow respiratory hygiene and cough etiquette.
- Triage areas should have signs asking that patients with severe respiratory tract infections with a recent history of travel to China should make themselves known so that appropriate arrangements can be made.



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## Case Definitions

### 1. Suspected case (under investigation)\*

- A person with an acute febrile respiratory infection with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or Acute Respiratory Distress Syndrome (ARDS))

**AND**

- With one or more of the following exposures during the 7 days prior to the onset of symptoms:
  - Travel to a country† where human cases of H7N9 avian influenza have recently been reported
  - Close contact‡ with a laboratory-confirmed case.

### 2. Probable Case

- A person fitting the definition of a Suspected Case but with no possibility of laboratory confirmation for H7N9 avian influenza, either because the patient or samples are not available for testing

**AND**

- Not already explained by any other infection or aetiology, including all clinically indicated tests for community acquired pneumonia according to local management guidelines.

### 3. Confirmed Case

- A person with laboratory confirmation of infection with H7N9 avian influenza at a WHO National Influenza Centre.

\* Although most of the cases to date have presented with a severe acute respiratory illness, mild cases have been reported. If doctors are concerned about patients presenting with milder illness, they should discuss this with the local public health authorities.

† Currently, China (including Hong Kong) and Taiwan are the only countries that have reported human cases of H7N9 avian influenza. Investigations suggest that Hong Kong and Taiwan cases were acquired in mainland China.

‡Close contacts include:

- Any person who provided care for the patient or who had other similarly close physical contact while not wearing appropriate PPE in the 7 days before symptom onset; this includes health care workers or family members.



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- Any person who stayed in the same household as a probable or confirmed case while the case was symptomatic.

**Advice for contacts of cases**

Contacts of cases should be directed to the <<PHU or CDC section>> for advice.

**Advice for travellers to China**

At this time, it is advisable that travellers to China keep away from sick and dead poultry and livestock and avoid visiting live animal markets.

**Advice for returned travellers**

At this time, if returned travellers meet the exposure criteria for the case definition but have a less severe respiratory illness, advice regarding further management should be sought from the local <<PHU or CDC section>>.

**Other useful links**

[UN Food and Agriculture Organization of the United Nations \(FAO\)](http://www.fao.org/news/story/en/item/173655/icode)  
(<http://www.fao.org/news/story/en/item/173655/icode>)