



**BC Centre for Disease Control**  
An agency of the Provincial Health Services Authority

655 West 12th Avenue  
Vancouver, BC V5Z 4R4

Tel 604.707.2400  
Fax 604.707.2441

www.bccdc.ca

## Emerging Respiratory Virus Bulletin - January 20, 2017

Dear Colleagues –

Please note the following recent developments in Emerging Respiratory Viruses warranting your attention:

### HIGHLIGHTS:

- A sudden, early and steep increase in human infections with avian influenza H7N9 has been reported in China, beginning in September 2016, and constituting a substantial ongoing [fifth wave](#).
- As in the previous four seasonal H7N9 waves since February 2013, most of the reported H7N9 human cases are older adult males, including one-third or more with fatal outcome.
- Most cases have reported recent exposure to infected poultry or contaminated environments, including live poultry markets. A few clusters have occurred for which limited human-to-human transmission cannot be ruled out.
- Poultry exposure opportunities and associated human cases may further increase with upcoming Lunar New Year festivities (January 27 and 28, 2017), announcing the Year of the Rooster
- Although rare, human cases of avian influenza have been previously documented in Canadian travelers returning from China (n=3), including [one case](#) of H5N1 returning to Alberta in December 2013 and [two cases](#) of H7N9 returning to British Columbia in January 2015.

### KEY ACTION AND ADVICE:

- For travellers to affected areas: Maintain strict personal, hand, food and environmental hygiene and avoid touching birds, poultry or their droppings or visiting markets, farms or other areas potentially contaminated by poultry droppings. All poultry and poultry products that are consumed, including eggs, should be thoroughly cooked. In the event of illness within 2 weeks of return to Canada that requires medical care, actively inform clinicians of travel abroad so they can manage and investigate appropriately.
- For attending clinicians: Maintain vigilance and actively elicit relevant travel and exposure history from patients presenting with acute illness that could be due to infectious disease, notably severe acute respiratory illness (SARI). If there are links to affected areas in the two weeks prior to symptom onset, notify the local Medical Health Officer and consult a microbiologist at the BCCDC Public Health Laboratory for testing advice, clearly indicating any relevant travel/exposure history with specimen submission. Follow strict infection prevention and control guidelines when collecting respiratory specimens.

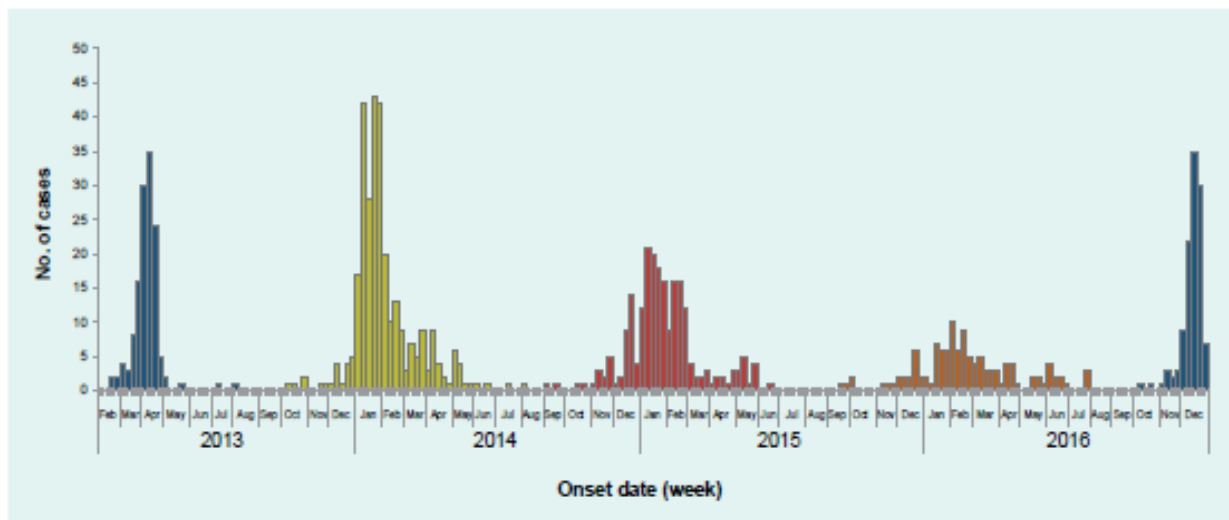
More epidemiological and management details are provided below, additionally addressing other recent Emerging Respiratory Virus activity. This includes sporadic infections with other kinds of avian influenza viruses in China; influenza H7N2 detections in cats and an associated human case in the United States; a human case of swine-origin H3N2v in Canada; and ongoing MERS-CoV activity in Saudi Arabia.

## A. EPIDEMIOLOGICAL UPDATES

### 1. Avian Influenza H7N9, China

Since September 2016, more than 100 human cases of avian influenza H7N9 infection have been reported as part of a fifth wave of H7N9 activity (see **Figure 1**).

**Figure 1. Epidemic curve of laboratory-confirmed human cases of H7N9 by week<sup>1</sup> (February 2013 to December 2016)**



<sup>1</sup> Excludes cases reported by Hong Kong SAR (China), Macao SAS (China) and Taiwan, China.

Source: Zhou L, Ren R, Yang L, Bao C, Wu J, Wang D, et al. Sudden increase in human infection with avian influenza A(H7N9) virus in China, September-December 2016. *Western Pac Surveill Response J.* 2017 Nov;8(1). Available from: <http://ojs.wpro.who.int/ojs/index.php/wpsar/article/view/521/733>

The epidemiological profile of reported cases is similar to previous waves, predominantly involving older adult males, including one-third or more with fatal outcome, and in association with prior poultry exposure. For example, among the 106 laboratory-confirmed cases reported in China with onset between November 22 and December 29, 2016, the median age was 54 years (range: 23-91 years), two-thirds were male and, at the time of report, 35 had died (case fatality: 33%) and 57 (54%) were considered in severe condition. Over three-quarters reported exposure to poultry or a live poultry market.

Fifth wave cases have been reported from provinces throughout south-eastern China, all of which had reported cases during prior waves, including Jiangsu (52), Zhejiang (21), Anhui (14), Guangdong (14), Shanghai (2), Fujian (2) and Hunan (1) (see **Figure 2**).

**Figure 2. Distribution of laboratory-confirmed human cases of H7N9 by place of reporting and wave (February 2013 to January 2017)**



Source: European Centre for Disease Prevention and Control. Communicable Disease Threats Report, Week 3, 15-21 January 2017. Stockholm: ECDC; 2017 Jan 20. Available: <http://ecdc.europa.eu/en/publications/Publications/communicable-disease-threats-report-21-jan-2017.pdf>

Two clusters have been reported as part of the current fifth wave, both involving two cases: one within the same family and one in a healthcare setting. Human-to-human transmission between cases within these clusters cannot be ruled out.

So far in 2017, three additional human H7N9 cases have been imported to other regions from China, including two returning travelers from China to Hong Kong Special Administrative Region (SAR) and one to Macao SAR. Two of the three imported cases had suspected exposure to live poultry in China. Two cases (one fatal) were adults  $\geq 60$  years old and one was a child  $< 18$  years old.

Like human influenza viruses, avian influenza viruses have a winter predilection. Avian influenza H7N9 was first identified in February 2013 and has circulated in China on a seasonal basis since then, with cases typically peaking in January/February. The total number of cases in prior waves has ranged from 100 to  $>300$  cases. Already, the number of cases reported to date as part of the current fifth wave exceeds the total number reported across the entire fourth wave. Avian influenza H7N9 is enzootic in poultry in China and exposure to infected poultry remains the major risk factor for infection with only limited instances of human-to-human transmission.

To date (as of January 12, 2017), a total of 918 laboratory-confirmed human infections with avian influenza H7N9 have been officially reported to the WHO.

## **2. Avian Influenza H5N6, China**

In November 2016, one new laboratory-confirmed case of avian influenza H5N6 was reported in an adult 20-64 years old in Guangxi Province, China. The case had exposure to dead poultry prior to illness onset.

Since 2014, a total of 16 human infections with avian influenza H5N6, including six deaths, have been reported to the WHO from China.

## **3. Avian Influenza H9N2, China**

In December 2016, one new laboratory-confirmed case of avian influenza H9N2 was reported in a young infant <1 year old in Guangdong Province, China. The case had exposure to a live poultry market before symptom onset and has since recovered.

Avian influenza H9N2 viruses are enzootic in poultry in China. Since 1999, H9N2 has been associated with at least 27 human infections and one death globally, of which three-quarters have been reported from China. The majority of H9N2 cases have occurred in children <18 years old.

## **4. Avian Influenza H7N2, New York**

In December 2016, one human infection with a novel avian lineage influenza H7N2 virus was reported associated with an outbreak in cats in New York that has since affected more than 350 cats. The human case reported prolonged and unprotected exposure to the respiratory secretions of infected cats and has since recovered. Although human infections with H7N2 have been documented previously, this is the first known case acquired through exposure to an infected cat. No further human-to-human transmission was identified. The virus was determined to be a low-pathogenic avian influenza (LPAI) virus, based on its ability to cause mild or asymptomatic disease in poultry.

Two previously documented human cases of LPAI H7N2 were reported in the United States, both of whom recovered: one in 2002 in a farmer who was in contact with chickens and one in 2003 in an immunocompromised adult whose source of infection was not identified. In 2007, 14 suspect human cases of H7N2 associated with a domestic poultry outbreak were reported in North Wales, although only two of these cases were lab confirmed. Other strains of H7 viruses have spread between animals and have also caused mild to severe disease in humans, including the ongoing H7N9 outbreak in China and previous human infections of H7N7 in the Netherlands and H7N3 in British Columbia, Canada associated with poultry outbreaks.

## **5. Variant Influenza H3N2 (H3N2v), Canada**

In December 2016, the Public Health Agency of Canada (PHAC) was notified of a human case of influenza H3N2 variant virus (H3N2v) in a young child who was in contact with swine on a farm. The child was hospitalized with pneumonia but has since recovered.

Human infections with swine-origin variant influenza viruses are rare. Most cases occur in children who present with typical influenza-like illness and are generally associated with exposure to swine. Cases of H3N2v have been reported previously in the United States, most notably in 2012 when over 300 cases were reported associated with outbreaks across multiple states. Limited human-to-human transmission has occurred with H3N2v, but no sustained community spread has been observed to date.

## **6. Middle East Respiratory Syndrome Coronavirus (MERS-CoV), Saudi Arabia**

Sporadic cases of MERS-CoV continue to be reported in Saudi Arabia. Most cases have been classified as primary cases with a history of exposure to camels or epidemiological investigations that are ongoing at the time of report. Limited nosocomial clusters of secondary transmission between patients and healthcare workers within healthcare settings have also been reported in recent months. Globally, since September 2012 (as of January 17, 2017), 1,879 laboratory-confirmed cases of infection with MERS-CoV, including at least 666 related deaths, have been reported to WHO.

### **B. ACTION AND ADVICE**

Persons traveling to China should be advised to maintain strict personal, hand, food and environmental hygiene while abroad and avoid touching birds, poultry or their droppings or visiting markets, farms or other areas potentially contaminated by poultry droppings. All poultry and poultry products that are consumed, including eggs, should be thoroughly cooked. In the event of illness within 2 weeks of return to Canada that requires medical care, patients should actively inform clinicians of travel abroad so they can manage and investigate appropriately.

Clinicians should maintain vigilance and actively elicit relevant travel and exposure history from patients presenting with acute illness that could be due to infectious disease, notably severe acute respiratory illness (SARI). In the event of links to affected areas in the two weeks prior to symptom onset (i.e. residence, travel history or contact with someone with such history), clinicians should notify their local health authority/Medical Health Officer and consult a virologist or microbiologist at the BCCDC Public Health Laboratory for advice related to diagnostic testing, clearly indicating the relevant travel or other exposure history with any submitted specimen.

For diagnostic testing for suspected avian influenza or MERS-CoV, lower respiratory specimens (e.g. sputum, endotracheal aspirate, or bronchoalveolar lavage) are recommended where possible and clinically indicated. Follow strict infection prevention and control guidelines when collecting respiratory specimens.

Health care workers should implement respiratory precautions immediately, and cases should be managed in respiratory isolation with contact and droplet precautions, inclusive of eye protection. Airborne precautions are warranted in the event of aerosol-generating procedures or conditions. Facilities should be mindful of the protection of other patients and visitors, in addition to healthcare workers, to minimize nosocomial transmission and risk.

### **C. ADDITIONAL RESOURCES**

#### **Avian Influenza**

H7N9 Case Definition – [www.phac-aspc.gc.ca/eri-ire/h7n9/case-definition-cas-eng.php](http://www.phac-aspc.gc.ca/eri-ire/h7n9/case-definition-cas-eng.php)

ERV/SARI Case Report Form – [www.phac-aspc.gc.ca/eri-ire/coronavirus/form-formulaire-eng.php](http://www.phac-aspc.gc.ca/eri-ire/coronavirus/form-formulaire-eng.php)

Case Management Guidelines – [www.phac-aspc.gc.ca/eri-ire/h7n9/guidance-directives/h7n9-2-eng.php](http://www.phac-aspc.gc.ca/eri-ire/h7n9/guidance-directives/h7n9-2-eng.php)

Interim Antiviral Treatment Guidelines – [www.ammi.ca/guidelines/](http://www.ammi.ca/guidelines/)

#### **MERS-CoV**

MERS-CoV Case Definition – [www.phac-aspc.gc.ca/eri-ire/coronavirus/case-definition-cas-eng.php](http://www.phac-aspc.gc.ca/eri-ire/coronavirus/case-definition-cas-eng.php)

ERV/SARI Case Report Form – [www.phac-aspc.gc.ca/eri-ire/coronavirus/form-formulaire-eng.php](http://www.phac-aspc.gc.ca/eri-ire/coronavirus/form-formulaire-eng.php)

Case Management Guidelines – [www.phac-aspc.gc.ca/eri-ire/coronavirus/guidance-directives/mers-cov-srmo-2-eng.php](http://www.phac-aspc.gc.ca/eri-ire/coronavirus/guidance-directives/mers-cov-srmo-2-eng.php)