



Epidemiological Update

Outbreaks of Avian Influenza due to reassortant viruses, public health implications for the Americas

21 April 2015

Situation summary

Since December 2014, agricultural authorities in Canada and United States of America have detected outbreaks of highly pathogenic avian influenza (HPAI)¹ in wild and domestic birds due to new reassortants of H5 influenza viruses, with the World Organization for Animal Health (OIE, per the French acronym) being notified accordingly. These are the first outbreaks due to HPAI H5 influenza reassortants of Eurasian origin registered in North America.

In **Canada**, outbreaks of HPAI **A(H5N2)** and HPAI **A(H5N1)** were detected in birds in the province of British Columbia and unrelated outbreaks of HPAI **A(H5N2)** were recently detected in birds in the province of Ontario.

In the **United States**, outbreaks of HPAI **A(H5N2)**, **A(H5N8)** and **A(H5N1)** have been registered in birds. To date, 10 states² have notified outbreaks of HPAI A(H5N2) to the OIE. These states are located along the Central, Mississippi and Pacific migratory routes of the birds. Six of the states,³ located on the Pacific migratory routes of wild birds, reported outbreaks of HPAI A(H5N8), and one state⁴ reported birds infected with HPAI A(H5N1).

The detections of these H5 reassortant viruses in birds in North America follows the introduction of genetically similar influenza A(H5N8) viruses in Europe. The H5N8 viruses detected in the USA and in Europe have been found to be genetically similar to those found in Japan and South Korea in 2014. In North America, genomic segments from the Eurasian A (H5N8) virus have combined with other circulating viruses in North America resulting in the emergence of the new H5 reassortants A(H5N1) and A(H5N2).⁵

The avian influenza A(H5N1) virus isolated in Canada and the United States is a new reassortant virus (of mixed-origins) which is genetically different from the avian influenza A(H5N1) that has caused human infections with high mortality in many countries. To date there have been no reported human infections with this new reassortant virus.

National and local authorities in Canada and the United States continue to enhance surveillance of domestic and wild birds. Additionally, they continue implementing measures

¹ Influenza avian viruses are divided into two groups based on their ability to cause disease in poultry: high pathogenicity or low pathogenicity. http://whalibdoc.who.int/hq/2005/WHO_CDS_2005.29.pdf

² Arkansas, Idaho, Kansas, Minnesota, Missouri, Montana, Oregon, South Dakota, Washington and Wyoming. These states are within the migratory routes of the Central, Mississippi, and Pacific flyways.

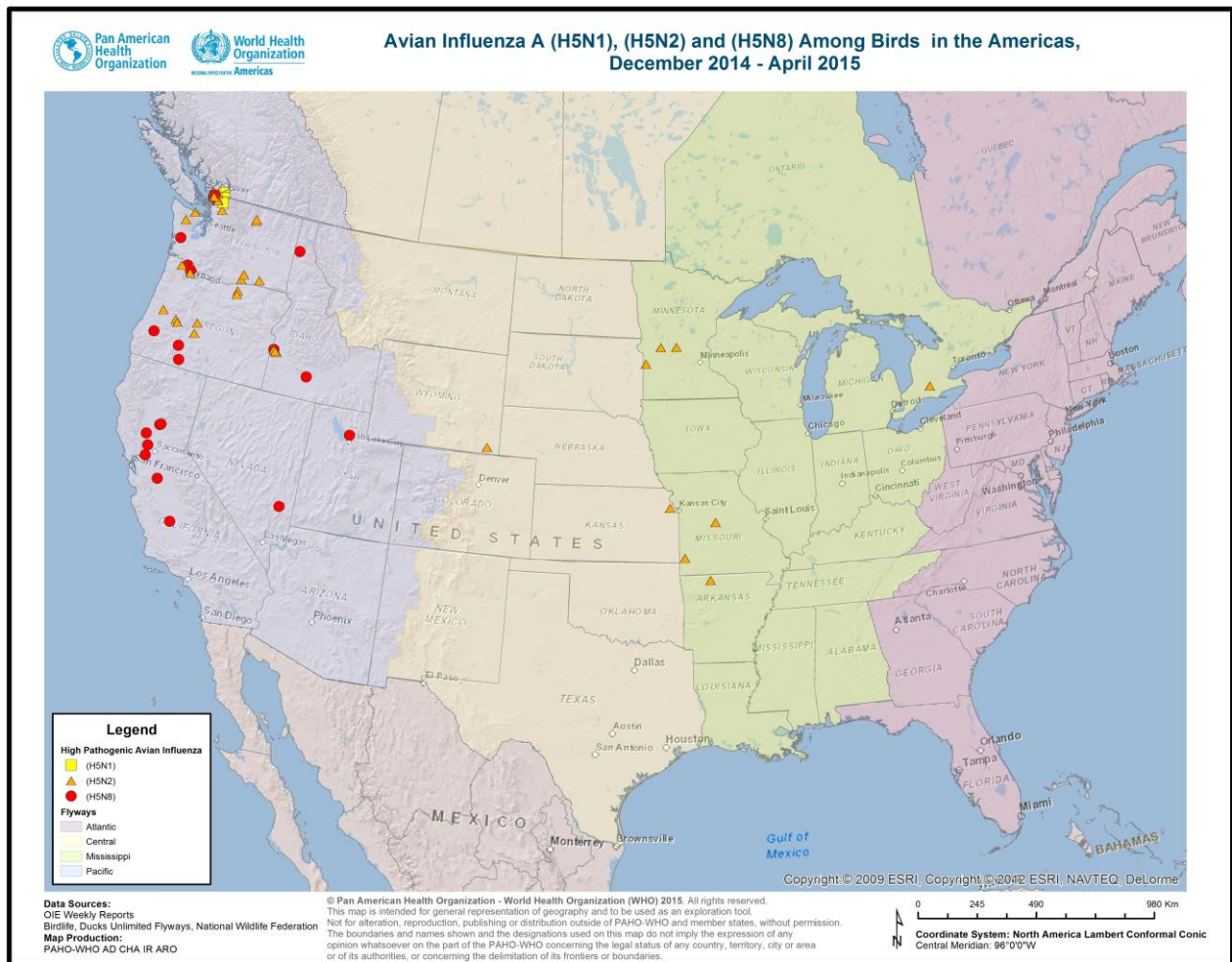
³ California, Idaho, Nevada, Oregon, Utah, and Washington

⁴ Washington

⁵ Ip HS, Torchetti MK, Crespo R, Kohrs P, DeBruyn P, Mansfield KG, et al. Novel Eurasian highly pathogenic influenza A H5 viruses in wild birds, Washington, USA, 2014. *Emerg Infect Dis*. 2015 May. Available at: http://wwwnc.cdc.gov/eid/article/21/5/14-2020_article

recommended to control the outbreaks, including quarantine, stamping out, movement control within the country and disinfection of infected premises/establishments.

Map: Avian A(H5N2), (H5N8), and (H5N1), among birds in the Americas. December 2014 – April 2015.



Advice to national authorities

Both HPAI and low pathogenic avian influenza (LPAI) viruses can spread rapidly among poultry through direct contact with waterfowl, other infected poultry, or through contact with fomites or surfaces contaminated with the virus. The infection of poultry with HPAI viruses can cause severe disease which results in high death rates. LPAI viruses infect poultry but are more often associated with subclinical infection. The terms HPAI and LPAI only apply to symptoms in poultry (chickens, in particular) and both types of viruses have the potential to cause infections in humans.

Human infections with avian influenza viruses are rare and when they have occurred, these viruses have not spread easily from person to person. So far there have been no reported human cases of infection with the avian influenza A(H5N8), A(H5N2) or A(H5N1) reassortant viruses in the Americas, or globally.

H5 avian influenza viruses, similar to those detected in Canada and the United States, have infected people in other parts of the world, therefore, the possibility of human cases associated with these avian influenza outbreaks cannot be excluded. Most human infections in other countries associated with these HPAI viruses have occurred after close contact with infected birds.

Currently, there is no evidence to suggest that the avian influenza viruses can be transmitted to humans through properly prepared poultry or eggs. A few A(H5N1) human cases have been linked to consumption of dishes made of raw contaminated poultry blood.

Intersectorial approach

Control of the disease in animals is the first step in decreasing risks to humans. Therefore, it is important, both in the animal and human health sector, to undertake prevention and control activities in a coordinated and collaborative manner. Efficient information sharing mechanisms should be established and/or strengthened to facilitate coordinated decision making.

The implementation of a surveillance program in wild birds is key to providing ecological data on infections in populations of migratory birds. These programs can provide information for modeling the potential spread and allow for more accurate risk analysis.

Surveillance for human infections

People directly or indirectly exposed to infected birds and those individuals participating in the culling and cleaning operations on affected farms are at risk of infection. Appropriate personal protective equipment (PPE) and other protective measures to prevent zoonotic transmission in these operators is strongly recommended.

For early detection of animal-human transmission, surveillance of exposed persons is recommended. It is recommended to monitor for the occurrence of influenza-like-illness (ILI) or severe acute respiratory infection (SARI) in persons who have been exposed to birds (domestic, wild, or captive birds) infected with avian influenza viruses.

Clinicians and health care workers should be informed of the possibility of human infection in exposed people and should consider testing patients with ILI or SARI who have had recent contact with birds infected with HPAI or LPAI viruses.

Laboratory diagnostics

The specific diagnosis of human infection with avian influenza is based on the detection of viral genome by molecular techniques (Polymerase chain reaction - PCR) in swab specimens (oropharyngeal or nasopharyngeal), nasopharyngeal aspirate or bronchoalveolar lavage (only in hospitalized patients), taken within the first seven (7) days (maximum 10) from the onset of symptoms.

The diagnostic algorithm includes an initial screening for Influenza A or B followed by the identification of the specific hemagglutinin protein gene that will define the subtype (H1, H3, H5, H7, etc.). All unsubtypeable influenza A viruses or those that are defined as an avian subtype (H5, H7, etc.) should be immediately sent, under appropriate conditions, to a reference laboratory or to a WHO Collaborating Centre (WHO CC) for a more complete antigenic and molecular characterization.

As part of the Global Influenza Surveillance and Response (GISRS), in the Region of the Americas, 22 of the 24 National Influenza Centres (NICs) and three national laboratories, in Latin America and the Caribbean, have the capacity for molecular detection of H5 (and also to detect some H7 and H9). In addition, established mechanisms are in place for quality control and shipment of samples for complete characterization to the U.S. Centers for Disease Control and Prevention (CDC) in Atlanta, which is the WHO Collaborating Centre for the Region.

Antiviral treatment

Evidence suggests that some antiviral drugs, notably oseltamivir, can reduce the duration of viral replication and improve the prognosis.

In suspected human cases, irrespective of severity, oseltamivir should be prescribed as soon as possible (ideally within 48 hours following symptom onset) to maximize its therapeutic benefits. The use of corticosteroids is not recommended.

References

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3. Avian influenza A(H5N8) detected in Europe... a journey to the West?. Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/ag/againfo/home/en/news_archive/2014_A-H5N8_detected_in_Europe.html
4. Avian influenza investigation in British Columbia. Canadian Food Inspection Agency. Available at: <http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/reportable/ai/2014-ai-investigation-in-bc/eng/1418491040802/1418491095666>
5. OIE-FAO Flu (OFFLU). OIE/FAO Reference Laboratories and experts for highly pathogenic avian influenza and low pathogenic avian influenza (poultry). Available at: <http://www.offlu.net/index.php?id=78>
6. Ip HS, Torchetti MK, Crespo R, Kohrs P, DeBruyn P, Mansfield KG, et al. Novel Eurasian highly pathogenic influenza A H5 viruses in wild birds, Washington, USA, 2014. Emerg Infect Dis. 2015 May. Available at: http://wwwnc.cdc.gov/eid/article/21/5/14-2020_article
7. United States Centers for Disease Control and Prevention: Interim Guidance on the use of antiviral medications for treatment of human infections with novel influenza A virus associated with severe human disease. Available at: <http://www.cdc.gov/flu/avianflu/novel-av-treatment-guidance.htm>

8. Bevins SN, Pedersen K, Lutman MW, Baroch JA, Schmit BS, et al. 2014. Large-Scale Avian Influenza Surveillance in Wild Birds throughout the United States. PLoS ONE 9(8): e104360. doi:10.1371/journal.pone.0104360.

Related links:

- WHO Avian influenza factsheet:
http://www.who.int/mediacentre/factsheets/avian_influenza/en/
- WHO Avian influenza in humans:
http://www.who.int/influenza/human_animal_interface/avian_influenza/en/
- WHO Influenza – Information resources: <http://www.who.int/influenza/resources/en/>
- WHO – Influenza at the Human-Animal Interface (HAI):
http://www.who.int/influenza/human_animal_interface/en/
- WHO – Avian influenza: food safety issues:
http://www.who.int/foodsafety/areas_work/zoonose/avian/en/index1.html
- FAO Avian Influenza – Food and Agriculture Organization of the United Nations:
<http://www.fao.org/avianflu/en/index.html>