Food and Agriculture Organization of the United Nations

alert

FAO ALERT FOR CENTRAL AMERICA AND SOUTH AMERICA: H5 HIGH PATHOGENICITY AVIAN INFLUENZA – RISK FOR INTRODUCTION AND SPREAD

13 September 2022

Key facts:

1. Avian influenza (AI) is a highly contagious viral disease with zoonotic potential that has severe impacts on animal health, livelihoods, economy and human health.
2. Wild waterfowls are considered the natural reservoir for low pathogenic avian influenza viruses. Wild migratory bird movements are one of the main drivers for the long-distance and intercontinental spread of highly pathogenic avian influenza (HPAI) viruses.
3. Trade with live poultry and poultry products is a major driver for HPAI spread within countries and across borders.
4. In its highly pathogenic form, AI most severely affects gallinaceous birds (e.g. chickens, turkeys, quails or guinea fowls), resulting in severe and acute systemic infection and high mortality. Domestic ducks have shown more resilience to HPAI virus infections. However, fatal outcomes may be reported even in these species.
5. HPAI has caused significant mortalities in some wild bird populations in recent epidemics, including endangered species under conservation efforts.
6. H5N1 HPAI emerged in 1996 in Asia, and since then has significantly diversified into subtypes and numerous genetic clades.
7. H5 HPAI viruses belonging to clade 2.3.4.4b are responsible for the transcontinental waves of HPAI outbreaks observed in Eurasia and Africa since 2016, and more recently (since late 2021) in North America.

The Food and Agriculture Organization of the United Nations (FAO) recommends that countries and territories in Central America and South America are on high alert for wild bird mortalities and poultry outbreaks or unusual poultry mortalities due to increased incursion risk of H5 HPAI. There has been a rapid spread of H5 HPAI in North America since early 2022 and the latest evidence indicates the circulation of HPAI viruses in certain wild bird populations in the region. Given the upcoming annual autumn migration of many species of North American birds to Central America and South America, the risk of HPAI introduction in currently unaffected areas located in migratory bird wintering areas has increased. Importantly, countries and territories in the Central America and South America regions should prepare for and implement enhanced measures for early detection, appropriate diagnosis and early response, in both wild birds and poultry.

Since 2020, the world has witnessed an unprecedented H5 HPAI intercontinental wave affecting both wild and domestic bird populations. H5 HPAI has reached more than 70 countries across Eurasia, Africa and the Americas, jeopardizing their poultry industry and avifauna. During that time, 18 countries have reported the disease for the first time. Current H5 HPAI persistence and spread to previously unaffected areas is strongly driven by wild bird introductions, and further spread at national and regional levels by poultry trade.

H5 HPAI EPIZOOTIC IN NORTH AMERICA

In the Americas, H5 HPAI viruses were first reported in December 2021 in Canada. This was the first transatlantic spread from Europe through the Arctic or pelagic migration routes (Caliendo *et al.*, 2022). Thereafter, H5N1 HPAI viruses spread further along the East Coast, eventually reaching the United States of America with the first wild bird case reported on 13 January 2022 in the State of South Carolina. Migrations to summer breeding grounds led to a rapid and extensive geographic distribution of HPAI in unaffected parts of Canada and the United States of America. As of 13 September 2022, H5 HPAI has affected 110 and 434 poultry holdings (commercial and backyard farms) in Canada and the United States of America, respectively. H5 HPAI outbreaks result in heavy economic losses for the poultry industry and the

local livelihoods of affected countries, with direct costs of flock culling and outbreak containment quickly reaching millions of United States dollars (USD). In addition, about 3 000 H5 HPAI events were recorded in wild bird populations in North America with more than 80 different wild bird species affected (see the Global AI viruses with zoonotic potential situation update for a list of affected species).

HPAI IN BIRDS

HPAI is a highly infectious disease that primarily affects domestic birds, and particularly gallinaceous birds (e.g. turkeys, chickens, guinea fowls and quails). In chickens and turkeys, the clinical course of HPAI may be acute and severe, wiping out a flock within hours or days. However, Gobbo *et al.* (2022) pointed out that silent infections (i.e. no clinical signs and/or no mortalities) involving H5N1 HPAI were observed in commercial chicken broiler flocks of several European countries in the period 2021–2022. There are no typical signs of HPAI that would allow a field diagnosis, but certain clinical signs can raise strong suspicion, including: sudden death, neurological signs (tremors, convulsions, torticollis, opisthotonos, nystagmus, paresis and paralysis); respiratory signs (nasal discharge, coughing and sneezing); decreased egg production or abnormal eggs; swelling of head, comb, eyelid, wattles and hocks; and purple discoloration of wattles, comb and legs. However, very early signs could be milder and more subtle, including reduction in feed and water intake. Wild waterbirds are the natural reservoir for AI viruses and contact or interactions (including indirect interactions) with poultry provide opportunities for virus spillover. Once introduced into a flock, onward spread of HPAI between farms is highly likely due to the movement of infected poultry, contaminated boots, clothing, vehicles and farm equipment, and via poultry faeces/litter or contaminated feed. In *Anatidae*[1] and other wild bird species, HPAI infections may be difficult to detect as they often are asymptomatic or subclinical, yet fatal outcomes have been observed in multiple species during this intercontinental wave.

While HPAI activity in North America has slightly decreased over the past weeks, detections in wild birds (including shorebirds, birds of prey and *Anatidae* species such as mallard, snow goose, Canada goose, American wigeon, American green-winged teal, gadwall, among others) and outbreaks in poultry continue to be reported, indicating that the virus is still widely circulating in the region. As the southwards migrations period is approaching (autumn in the Northern Hemisphere), when migratory birds will move along the Americas flyways from northern breeding grounds to wintering grounds located in the warmer south, the risk of introduction and spread in unaffected areas of the Central America and South America regions is likely to increase in the coming months. Countries and territories of these regions should prepare for potential HPAI incursions, in particular along migratory flyways.

ZOONOTIC POTENTIAL OF H5 HPAI VIRUSES

It is important to note the wide range of species shown to be susceptible to these viruses, including mammalian species. In North America alone, more than 100 events were reported in wild mammals, in nine different species including bobcat (*Lynx rufus*), common bottlenose dolphin (*Tursiops truncates*), common raccoon (*Procyon lotor*), coyote (*Canis latrans*), harbor seal (*Phoca vitulina*), American mink (*Neovison vison*), red fox (*Vulpes vulpes*), skunk (*Mephitis mephitis*), and Virginia opossum (*Didelphis virginiana*).

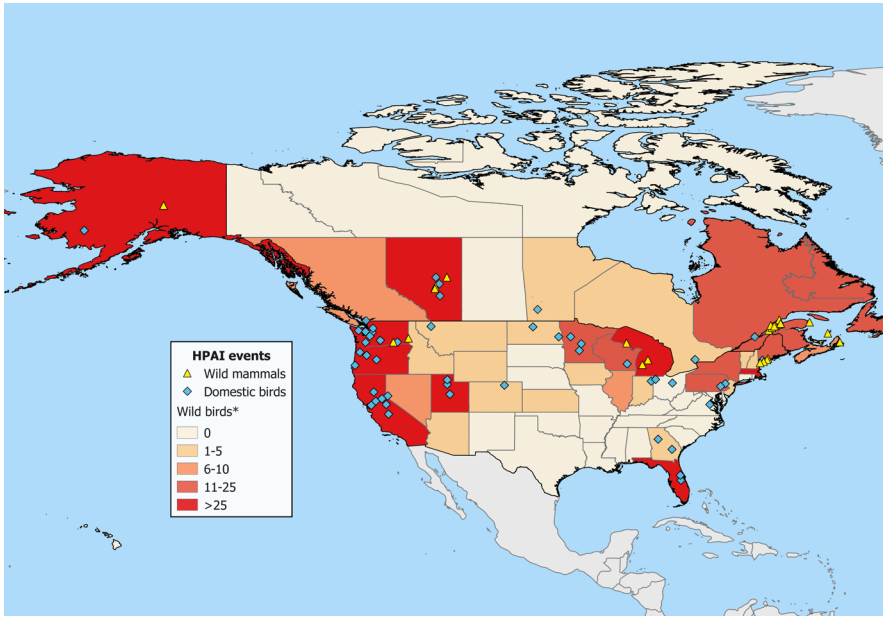
[1] The family *Anatidae* includes ducks and most duck-like waterfowl (i.e. geese and swans). https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/anatidae

In addition, Eurasian countries have reported events in mammals, such as Ezo red fox (*Vulpes vulpes schrencki*), grey seal (*Halichoerus grypus*), harbor seal (*Phoca vitulina*), red fox (*Vulpes vulpes*) and Japanese raccoon dog (*Nyctereutes viverrinus*). Generally, wild mammals are considered dead-end hosts, though investigation of a recent influenza A (H5N1) outbreak in seals in northeastern United States of America concluded that seal-to-seal transmission may have occurred (Puryear *et al.*, 2022). Since mammalian adaptation increases zoonotic risk, it is recommended to closely monitor such events in wild mammal populations once the virus has been detected in wild birds in the wider region and collect appropriate samples that should include brain samples for the neurotropism that avian influenza viruses exhibit in mammals (see recommendations below).

Given the zoonotic potential already demonstrated by these viruses in the past, precautions should be taken to reduce human exposure. FAO further reminds countries and territories about the importance to share full genome sequences and virus isolates with the scientific community in a timely manner for further analysis and research to establish epidemiological links between outbreaks, monitor virus evolution and assess the zoonotic potential of emerging viruses. This information is also used to match the appropriate vaccines for humans to currently circulating strains, and novel virus strains.

FAO and the World Organisation for Animal Health (WOAH, founded as OIE) continue to closely monitor the situation and provide updates on new events. Information provided by the United States Department of Agriculture (USDA) and the Canadian Food Inspection Agency (CFIA) – especially on events in wild birds – is of particular value for early warning purposes.

Figure 1. Confirmed H5 HPAI events in wild and domestic birds, and in wild mammals in North America since 1 June 2022.



Source: UN. 2020. Map of the world. Cited 14 September 2022. https://geoservices.un.org/Html5Viewer/index.html?viewer=clearmap, modified with data from Animal and Plant Health Inspection Service (APHIS) of the USDA, Canada Food Inspection Agency (CFIA), and Emergency Prevention System (EMPRES) Global Animal Disease Information System (EMPRES-i) databases.

Note: *Data related to HPAI events in wild bird was aggregated at State and Province administrative levels for the United States of America and Canada, respectively. County centroid geolocations were used for domestic bird events in the United States of America. Exact geolocations were used for all wild mammal events and domestic bird events in Canada.

Disclaimer: The boundaries and names shown and the designations used on these map(s) do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

Useful Links

- Global Avian Influenza Virus with Zoonotic Potential situation update – (available through email distribution; if interested please contact: EMPRES-Livestock@fao.org)
- USDA APHIS – 2022 Detections of Highly Pathogenic Avian Influenza
- CFIA Response to detections of avian influenza in Canada
- FAO Alert for the Americas, March 2022: H5 Highly Pathogenic Avian Influenza – risk for introduction and spread – English, French and Spanish
- FAO focus on: Highly pathogenic H5 avian influenza in 2016 and 2017 – observations and future perspectives
- Preparing for Highly Pathogenic Avian Influenza (FAO Manual No.3 - 2006) - English, Spanish and multiple other languages
- Wild Bird Highly Pathogenic Avian Influenza Surveillance (FAO Manual No. 4 - 2006) – English, French and multiple other languages
- Wild Birds and Avian Influenza (FAO Animal Health Manual No. 5 - 2007) – English, French and multiple other languages
- Carcass management guidelines (FAO Animal Production and Health Guidelines No.23 - 2006) – English, French and multiple other languages
- Good Emergency Management Practice: The Essentials (FAO Manual No. 25 – 2021) – English and Spanish
- Biosecurity for Highly Pathogenic Avian Influenza (FAO Manual No.165 – 2008) – in English and French
- Manual for the management of operations during an animal health emergency (FAO Manual No. 27 – 2022) – in English
- WOAH/FAO Network of Expertise on Animal Influenza (OFFLU) website
- World Health Organization (WHO) avian influenza page
- World Organisation for Animal Health (WOAH) avian influenza page
- WHO Vaccine Composition Meeting Report – February 2022

FAO ADVISES COUNTRIES AND TERRITORIES AT RISK TO:

- Conduct national risk assessments to identify areas at higher risk of HPAI introduction.
- Increase surveillance efforts in areas identified to be at higher risk of HPAI introduction through wild birds (particularly ducks, geese and other water birds as well as raptors and scavenging birds), e.g. areas located along migratory flyways, by immediately testing sick or dead poultry as well as dead/hunted wild birds for the presence of HPAI viruses.
- Limit direct and indirect contact between domestic poultry and wild birds (e.g. keep poultry indoors, use fences or nets to reduce contact between domestic poultry and wild birds); pay particular attention to sources of poultry drinking water to ensure it cannot be contaminated or it is treated appropriately before use.
- Raise awareness among poultry keepers, the general population, traders, marketers, hunters and any other relevant stakeholders about HPAI, precautionary and personal protection measures as well as reporting and collection mechanisms for sick or dead birds.
- Ensure laboratories have capabilities for diagnosis of the circulating H5 HPAI viruses.
- Provide mechanisms for reporting sick or dead birds or mammals (hotlines, collection points) and raise awareness about the importance of reporting.
- Ensure sampling teams are informed about the collection of appropriate samples (e.g. oropharyngeal and cloacal swabs in birds, and additionally brain and systemic tissue samples in mammals).
- Ensure implementation of biosecurity measures along the poultry value chain, including farms, especially those in close proximity to wild bird habitats, to limit further spread of the disease.
- Ensure contingency plans for outbreak response are reviewed and tested.
- Ensure the preparedness of veterinary services and availability of resources for the humane culling and disposal of large numbers of poultry.
- On infected farms, conduct appropriate cleaning and disinfection and take action on carcasses, slurry and faecal waste to ensure they do not pose a risk for further transmission and spread of the virus, see FAO's carcass management guidelines: https://www.fao.org/3/cb2464en/cb2464en.pdf.
- Upon detection of outbreaks, alert neighbouring countries as well as international organizations in a timely manner, including WOAH.
- Share full genome sequences, studies on antigenic characterization and virus isolates with the scientific community for further analysis and research; or send specimens for full genome sequencing to an international reference laboratory – for the benefit of all countries at risk.
- Initiate/reactivate a compensation policy and allocate financial resources; ensure compensation for poultry culled as part of control measures during an HPAI outbreak is provided in a timely manner, see Good Emergency Management Practice pp. 18-19: http://www.fao.org/3/a-ba0137e.pdf.

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- If vaccines are being used to prevent avian influenza, assess antigenic characteristics of any new viruses detected using antisera from vaccinated birds; ensure antigenic assessments are done on any H5 HPAI viruses detected in well vaccinated, clinically affected flocks and, where necessary, update vaccine virus. It is important to recognize the possibility of breakthrough infections in vaccinated flocks from these strains, especially those in which immunity is not uniform or levels of antibody are low. For further information on avian influenza vaccination, please write to secretariat@offlu.org
- Pre-emptive vaccination may be considered for high risk species such as turkeys or layer chickens, provided a vaccination strategy is well established.
- Action against wild birds, particularly indiscriminate hunting or destruction of habitat, should not be undertaken.

FAO ACTIONS TO SUPPORT MEMBERS:

- Monitoring and assessing the evolving disease situation, and conducting risk assessments as needed. To share updates on your country situation, please do not hesitate to contact FAO at FAO-GLEWS@fao.org
- Liaising with FAO/WOAH Reference Laboratories and partner organizations to assess virus characteristics and provide laboratory protocols for detection.
- Raising awareness about important epidemiological and virological findings and their implications.
- Building capacities of animal health authorities through the provision of online trainings covering avian influenza epidemiology, detection, prevention and control. Please contact VLC-Global@fao.org if you need a training course for your subregion/region.
- Providing recommendations for affected countries/territories and those at risk addressing preparedness, prevention and disease control.
- Providing support for risk assessment and mapping to identify hot spots for risk mitigation and the implementation of risk-based surveillance.
- Offering support in provision of diagnostic reagents and personal protective equipment, provided certain conditions are met (contact: EMPRES-Lab-Unit@fao.org).
- Offering assistance to national authorities for the shipment of samples as well as virus subtyping and sequencing, provided certain conditions are met (contact: EMPRES-Shipping-Service@fao.org).

To contact FAO for further information or support please write to Keith Sumption, FAO Chief Veterinary Officer at CVO@FAO.ORG.