

Technical Issue Update - Global High Pathogenicity Avian Influenza Events

Developed by the National Avian Influenza Wild Bird Steering Group

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Summary

Over the past year, there have been many detections overseas of reassortant high pathogenicity H5 avian influenza (HPAI) viruses in wild birds and poultry. Based on recent reports to the [World Organisation for Animal Health \(OIE\)](#)¹, there is a high number of new and ongoing HPAI outbreaks reported by countries, notably in Asia and Europe.

The current widespread and frequent detection of reassortant HPAI viruses in the northern hemisphere likely means an increased level of risk to Australia, though previous research has assessed the overall risk of introduction of HPAI to Australia to be low ([East et al. 2008](#); [East et al. 2008](#); [Curran 2012](#))².

Therefore, increased awareness and vigilance by Australian poultry producers and wildlife health professionals is advised. Further information about the risks to Australia and what should be done in Australia is outlined below.

What is Avian Influenza?

- Avian influenza virus (AIV) infection can cause severe disease in poultry and can also infect and cause disease in a range of other species including wild birds and humans.
- Sixteen haemagglutinin (HA; H1-H16) and 9 neuraminidase (NA; N1-N9) subtypes are recognised in birds.
- Of global concern is the capacity of AIV subtypes H5 and H7 to mutate from Low Pathogenicity (LPAI) to High Pathogenicity (HPAI) forms which can cause significant losses in both poultry and wildlife.
- Multiple lineages and strains of AIVs have been classified based on AIV sequence analysis and distributions of the viruses in hosts, geographic locations and time. Avian influenza viruses constantly evolve by error-prone replication (mutation) and reassortment resulting in ongoing emergence of new lineages and reassortants.
- Wild waterfowl and to a lesser extent, shorebirds, are the main natural reservoirs for LPAI viruses, with infection typically resulting in only mild or no clinical signs of disease in these birds.

AIV in Australia

- LPAI viruses have been detected in wild birds in Australia. Find out more on the [WHA website](#)³.
- Whilst a rare occurrence, LPAI viruses can spill over from wild bird populations into poultry.
- Since 1976, there have been eight outbreaks due to HPAI H7 viruses in commercial poultry operations in Australia, with the most recent being in 2020 in Victoria. All had obvious or circumstantial evidence of contact with wild waterfowl or inadequately treated drinking water, potentially contaminated by wild waterfowl. These outbreaks were most likely caused by introduction of local wild bird LPAI viruses and subsequent mutation from LPAI to HPAI after circulation in poultry: a well-documented occurrence.
- HPAI H5 viruses have not been detected in Australia. HPAI viruses have not been detected in Australian wild birds, other than a single detection of HPAI H7 virus in one feral Eurasian starling trapped inside an affected poultry shed during the 1985 HPAI H7 virus outbreak.

¹ <https://www.oie.int/en/animal-health-in-the-world/update-on-avian-influenza/2020/>

² Note: a formal risk assessment for the current HPAI strains circulating has yet to be undertaken.

³ <https://www.wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx>

- Data generated by the [National Avian Influenza Wild Bird Surveillance \(NAIWB\) program](#), which screens samples from wild birds for AIVs, is used to monitor and understand avian influenza in wild birds in Australia. No HPAI H5 or H7 viruses have been detected in via targeted wild bird surveillance in Australia.
- Sequence analysis of AIVs detected in wild birds through the NAIWB program contributes to tracking Australian virus evolution and dynamics, maintaining currency of diagnostic tests, and maintaining a virus sequence library allowing comparison of Australian and overseas strains.
- Based on sequence analysis to date it can be concluded that incursions of overseas AIVs into Australia are infrequent ([Kishida et al. 2008](#), [Vijaykrishna et al. 2013](#), [Bhatta et al. 2020](#)).

Current Global High Pathogenicity Avian Influenza Situation

- Since 25 December 2020 more than 215 new HPAI outbreaks were reported in domestic birds⁴ and 79 new outbreaks in non-poultry, including wild birds⁵ in Asia, Europe and Africa to the [World Organisation for Animal Health](#) (OIE)^{6,7}. Over 794 HPAI outbreaks in poultry and non-poultry are still ongoing.
- The current AIV lineage circulating widely in the northern hemisphere - Goose Guangdong (gs/GD) HPAI H5Nx virus clade 2.3.4.4 group B⁸ - originally emerged in 2014 and has shown intercontinental spread via wild birds on multiple occasions, including from Asia to Europe, Africa, and North America.
- Clade 2.3.4.4 group B viruses have been detected in apparently healthy wild birds, which suggests the birds are able to spread the viruses more widely than if they became ill. This has facilitated rapid intercontinental spread of these AIVs through bird migration.
- Whilst detected in apparently healthy wild birds, clade 2.3.4.4 group B viruses can infect many different species of wild birds with clinical manifestations spanning from none to mass mortality events.

The risk of AI to Australian wild birds and commercial poultry

- LPAI viruses known to circulate in Australian wild birds remain a constant biosecurity threat to Australian poultry through direct or indirect (e.g. contaminated drinking water) contact.
- Recent AIV [outbreaks in Victoria](#) in poultry in 2020 were due to strains of AIVs closely related to LPAI viruses circulating in Australian wild bird reservoir species, and not an imported AIV strain from Asia or elsewhere. Read more in [the Conversation](#).
- HPAI viruses circulating in commercial poultry and wild bird populations in the northern hemisphere are not usually considered a threat to Australia since only shorebirds and no waterfowl undertake annual migrations from HPAI affected areas in the northern hemispheres to Australia.
- Recent Australian research has demonstrated that a migratory shorebird, the red-necked stint, is being exposed to HPAI H5Nx clade 2.3.4.4 viruses along their migratory route between Asia and Australia. There is currently no evidence that migratory birds are still carrying infectious HPAI H5Nx clade 2.3.4.4 viruses when they arrive in Australia ([Wille et al 2019](#)).
- Thus far, Australia remains free from HPAI H5Nx clade 2.3.4.4 viruses that are currently being detected in the northern hemisphere.

⁴ subtypes H5, H5N1, H5N5, H5N6 and H5N8

⁵ subtypes H5, H5N1, H5N3, H5N5 and H5N8

⁶ <https://www.oie.int/en/animal-health-in-the-world/update-on-avian-influenza/2020/>

⁷ https://www.oie.int/wahis_2/public/wahid.php/Diseaseinformation/WI

⁸ A/Goose/Guangdong/1/1996 (gs/GD) H5 virus clade 2.3.4.4; Further information on nomenclature can be found here: https://www.who.int/influenza/vaccines/virus/202002_zoonotic_vaccinevirusupdate.pdf?ua=1

- The current widespread and frequent detection of reassortant HPAI viruses in the northern hemisphere, notably Europe and Asia, likely means an increased level of risk to Australia, though previous research has assessed the overall risk of introduction of HPAI to Australia to be low ([East et al. 2008](#); [East et al. 2008](#); [Curran 2012](#))⁹.

What should Australia do to reduce our exposure?

There is a need to remain vigilant by:

- Maintaining best biosecurity practices [Biosecurity Guidelines for [Poultry Producers](#) and [Wildlife Professionals](#)]
- Deterring wild birds, particularly waterfowl, from any poultry farms and minimizing indirect contact by treating drinking water for poultry.
- Continuing to report and investigate unusual and mass sickness and deaths in domestic and wild birds.
You can call the Emergency Animal Disease Watch Hotline on 1800 675 888 wherever you are in Australia. This will put you in touch with your department of agriculture or primary industries. See: <https://www.outbreak.gov.au/report-outbreak>
- Unusual signs of disease or deaths in wildlife you can also be reported to [State/Territory WHA Coordinator](#)
- Continuing to strengthen and monitor AIV strains circulating in apparently healthy Australian wild birds for overseas strains through the NAIWB program.

What is currently being done to address the potential AIV threat?

- Australia's [national avian influenza wild bird surveillance program](#) includes:
 - **Targeted surveillance:** 'apparently' healthy, live and hunter-shot wild birds
 - **General surveillance:** investigation of significant, unexplained morbidity / mortality events in wild birds (with a focus on H5 and H7 exclusion testing).
- Sequence analysis of AIVs detected in wild birds through the national program contributes to tracking Australian virus evolution and dynamics, maintaining currency of diagnostic tests, maintaining a virus sequence library allowing comparison of Australian and overseas strains. Read more in [Wild Bird News](#).
- A number of recent publications have assessed the risk to Australia from endemic and overseas AIV strains. See the [WHA website](#) for a list of recent papers.
- Current ongoing analysis continues to assess and analyse:
 - patterns of wild bird virus infections in Australia.
 - wild bird AIV sequence data to better understand transmission patterns (including reassortant events) and connections across space, time and species.
 - development of [Nextstrain software](#) to track Australian AIV evolution in real-time.

⁹ Note: a formal risk assessment for the current HPAI strains circulating has yet to be undertaken.

Further information

Please note: all Australian Jurisdictions require that all avian influenza virus infection is reported to the relevant Chief Veterinary Officer (CVO). The national notifiable diseases list does not specify strains of AI but includes avian influenza. For further information see: <https://www.agriculture.gov.au/pests-diseases-weeds/animal/notifiable>

Global Situation

- World Organisation for Animal Health (OIE) updates on avian influenza in animals (types H5 and H7): <https://www.oie.int/en/animal-health-in-the-world/update-on-avian-influenza/2020/>
- Avian influenza in Europe update: <https://www.izsvenezie.com/reference-laboratories/avian-influenza-newcastle-disease/europe-update/>
- Convention on the Conservation of Migratory Species of Wild Animals Northern Winter 2020-2021 statement in response to die-offs of wild birds in UNESCO and Ramsar Sites: <https://www.cms.int/en/document/northern-winter-2020-2021-statement-response-die-offs-wild-birds-unesco-and-ramsar-sites-0>

AUSVETPLAN

- The on-the-ground response to this incident is in accordance with the Avian Influenza AUSVETPLAN. This plan sets out the nationally agreed approach to Avian Influenza outbreaks in Australia. This includes agreed policy in Australia with respect to LPAI or HPAI detection in wild birds. The **AUSVETPLAN Disease Strategy for Avian Influenza** can be downloaded from [Animal Health Australia website](#) under Disease-specific documents.

Australian Biosecurity Manuals

- National Farm Biosecurity Manuals – Chickens: <https://www.farmbiosecurity.com.au/industry/chickens/>
- National Wildlife Biosecurity Manual: https://wildlifehealthaustralia.com.au/Portals/0/Documents/ProgramProjects/National_Wildlife_Biosecurity_Guidelines.PDF
- National Zoo Biosecurity Manual: <https://www.zooaquarium.org.au/public/Animal-Welfare/Biosecurity/Public/Animal-Welfare/Biosecurity.aspx>

Australian Department of Agriculture, Water and the Environment

- Information on Avian Influenza or Bird Flu: <https://www.agriculture.gov.au/pests-diseases-weeds/animal/avian-influenza>
- Information for bird owners: https://www.agriculture.gov.au/pests-diseases-weeds/protect-animal-plant/bird-owners/avian_influenza_bird_flu
- Descriptive characteristics of the seven HPAI outbreaks in Australia from 1976 to 2013 and of the confirmed LPAI reports in poultry in Australia from 1976 to 2018 are described in [Scott et al. 2020](#).

Wild bird surveillance

- A [Wild Bird Surveillance program](#) is in place across Australia.
- WHA Fact sheet on [avian influenza in wild birds in Australia](#).