OVERSEAS EMERGING RESPIRATORY VIRUS INTELLIGENCE

Highly Pathogenic Avian Influenza A(H5NX)

On 6 September 2024, the US Centers for Disease control and Prevention (CDC) reported a human case of avian influenza A(H5) in Missouri.[1] The case was identified through the seasonal influenza surveillance system and has recovered following hospitalisation. No onwards transmission of this virus has been identified. The case had no known animal exposure prior to illness onset, and investigations into the potential source of the infection are ongoing. H5 avian influenza outbreaks have been detected in poultry in Missouri in 2024 and in wild birds there in the past. No A(H5N1) dairy cattle outbreaks have been reported in the state to date. This is the 14^{h} human case of infection with influenza A(H5) reported in the United States in 2024 and the first without a known occupational exposure to sick or infected animals. There are no indications of unusual human influenza activity through the Missouri influenza surveillance system.[2] Based on currently available information, the CDC continues to assess the risk to the general public from H5N1 as low.

Clade 2.3.4.4b

Avian influenza A(H5N1) clade 2.3.4.4b has spread throughout poultry and wild birds across Africa, Asia, Europe and the Americas, and was detected on Antarctica's mainland in February 2024.[3, 4] It has never been detected in New Zealand, Australia or the Pacific Region. Since January 2022, 25 human cases of avian influenza H5N1 clade 2.3.4.4b have been reported in Europe (7 cases), Asia (2 cases) and the Americas (16 cases). All cases had direct or indirect exposure to sick poultry/birds (21 cases) or dairy cattle (4 cases) before illness onset, and there is no evidence of sustained human-to-human transmission.[3, 5]

On 14 August 2024, the joint FAO/WHO/WOAH assessment on the recent influenza A(H5N1) virus situation in animals and people was updated.[3] The global public health risk of influenza A(H5N1) is assessed as low, and the risk for occupationally exposed persons as low to moderate, depending on risk mitigation measures in place. Additional human infections in those exposed to infected animals or contaminated environments are likely to occur, however the public health impact of these infections is minor at the global level.

As of 11 September 2024, the number of human cases of influenza A(H5N1) clade 2.3.4.4b infection associated with the multi-state dairy cattle outbreak remains at four, as reported by the CDC.[5] All cases were dairy farm workers exposed to infected livestock, and all reported mild symptoms and recovered. Studies have demonstrated that seroprevalence to HPAI A(H5N1), even among workers with known exposures, is low reflecting generally poor ability of this virus to transmit to humans.[6] Influenza A(H5N1) has been detected in 197 dairy herds in 14 states. In the past 30 days, there have been detections in 9 herds in 4 states including the first detections in California.[7] Other farm animals in multiple states, including mice, domestic cats, and alpacas have also been reported.[8] There has also been evidence of transmission of A(H5N1) from dairy to poultry farms. Epidemiological findings from Michigan suggest that the majority of transmission between farms is through shared movement of people, vehicles and equipment between premises.[9]

As of 11 September 2024, the CDC has also reported nine confirmed cases of A(H5) in poultry farm workers involved in depopulating A(H5N1) infected poultry at two farms in the same Colorado county.[10] Genomic

analysis of virus isolated from three of the workers showed they are closely related to the dairy cattle clade 2.3.4.4b outbreak.[11] One state has reported outbreaks in commercial or backyard poultry flocks in the past 30 days.[12]

On 9 August 2024, the CDC published their assessment of potential pandemic risk posed by currently circulating influenza A(H5N1) viruses, based on virus isolated from the first human case of infection following exposure to infected dairy herds. The current overall individual and population health risk to the general public from this virus remains low, and the future pandemic risk is assessed as moderate, which is similar to previous assessments of earlier influenza A(H5N1) viruses.[13]

Clade 2.3.2.1.c

On 2 September 2024, the WHO published a risk assessment for avian influenza A(H5N1) in Cambodia following the notification of a confirmed case due to clade 2.3.2.1c in a 15 year old child.[14] Cambodia has reported 10 human cases of infection due to influenza A(H5N1) in 2024,, most of whom had known exposure to dead or sick poultry prior to illness onset. Available evidence suggests that the virus has not acquired the capacity for sustained human-to-human transmission. Further cases are expected as the virus continues to circulate among poultry in Cambodia. The overall public health risk posed by this virus was assessed as low.

Clade 2.3.2.1a

On 22 May 2024, the Victorian Department of Health (Australia) reported the retrospective identification of a human case of infection with influenza A(H5N1) clade 2.3.2.1a. The case was a child who acquired infection in India in March before returning to Australia and recovered following severe infection. There was no evidence of onwards human transmission. This clade has previously been detected among birds in India.[15]

ESR public health risk assessment

Given the potentially high impact of the disease, very low likelihood of sustained human-to human transmission and very low likelihood of importation of a human case of influenza A(H5N1), the overall public health risk of avian influenza A(H5N1) to Aotearoa New Zealand is low. However, due to the pandemic potential of avian influenza viruses should there be a change in viral transmissibility, national preparedness activities led by the Ministry for Primary Industries, Health New Zealand and the Public Health Agency are ongoing.

Other human cases of avian and swine influenza

On 4 September 2024, the WHO published a risk assessment on Vietnam's first human case of infection with influenza A(H1N1) variant virus. The case had underlying medical conditions and has died. No secondary cases have been identified. The source of infection remains unknown. Based on currently available information, WHO assesses the current risk to the general population posed by this virus as low.[16]

In August 2024, the CDC reported four human cases of infection with swine influenza in the US: two cases of A(H3N2) variant virus, one case of influenza A(H1N1) variant virus and one case of influenza A(H1N2) variant virus. Three cases had exposure to swine prior to illness onset, while the source remains under investigation for one case.[17]

From 8 June to 19 July 2024, two human cases of infection with influenza A(H5N6) in China, one human case of infection with influenza A(H9N2) in China, and two human cases of infection with influenza A(H1N2) variant virus in the US were reported. All cases had exposure to poultry or swine prior to illness onset.[18]

Australia is responding to outbreaks of HPAI H7 viruses in 16 commercial and domestic poultry flocks; eight in Victoria, six in New South Wales and two in the ACT.[19] There has been no associated human illness.

WHO risk assessment for influenza at the human-animal interface

As at 19 July 2024, the WHO advises that the overall public health risk from currently known influenza viruses at the human-animal interface has not changed, and the sustained human-to-human transmission of these viruses is currently considered unlikely. Human infections with viruses of animal origin are not unexpected at the human-animal interface wherever these viruses circulate in animals.[18]

Middle East respiratory syndrome coronavirus (MERS-CoV)

A total of four MERS-CoV cases, all fatal, have been reported in 2024.[20] All cases were from Saudi Arabia. The WHO's risk assessment remains moderate at the global and regional levels. The WHO expects additional cases of MERS-CoV to be reported from the Middle East and/or other countries where MERS-CoV is circulating in dromedaries.[21]

References

1. US Centers for Disease Control and Prevention. CDC Confirms Human H5 Bird Flu Case in Missouri. 06 September 2024 [Available from: *https://www.cdc.gov/media/releases/2024/s0906-birdflu-case-missouri.html*. [Accessed 12 09 2024]

2. Missouri Department of Health & Senior Services. Human H5 bird flu case confirmed in Missouri. 06 September 2024 [Available from: *https://health.mo.gov/news/newsitem/uuid/0ca9d648-cb9b-4eca-99a8-f9a1c96a01bd/human-h5-bird-flu-case-confirmed-in-missouri*. [Accessed 12 09 2024]

3. FAO/WHO/WOAH. Updated joint FAO/WHO/WOAH assessment of recent influenza A(H5N1) virus events in animals and people. 12 August 2024. Available from: *https://www.who.int/publications/m/item/updated-joint-fao-who-woah-assessment-of-recent-influenza-a(h5n1)-virus-events-in-animals-and-people*. [Accessed 15 08 2024]

4. World Organization for Animal Health. Wildlife under threat as avian influenza reaches Antarctica. 13 March 2024 [Available from: *https://www.woah.org/en/wildlife-under-threat-as-avian-influenza-reaches-antarctica/*. [Accessed 17 04 2024]

5. US Centers for Disease Control and Prevention. H5 Bird Flu: Current Situation. 10 September 2024 [Available from: *https://www.cdc.gov/bird-flu/situation-summary/index.html*. [Accessed 12 09 2024]

6. US Centers for Disease Control and Prevention. Summary of H5N1 Seroprevalence Studies. 05 June 2024 [Available from: *https://www.cdc.gov/ncird/whats-new/H5N1-seroprevalence-studies.html*. [Accessed 25 07 2024]

7. U.S Department of Agriculture. HPAI Confirmed Cases in Livestock. 10 September 2024 [Available from: *https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/hpai-confirmed-cases-livestock*. [Accessed 12 09 2024]

8. U.S Department of Agriculture. Detections of Highly Pathogenic Avian Influenza in Mammals. 10 September 2024 [Available from: *https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/mammals*. [Accessed 05 09 2024]

9. U.S Department of Agriculture. 2024 Highly Pathogenic Avian Influenza (H5N1) - Michigan Dairy Herd and Poultry Flock. 09 June 2024. Available from: *https://www.aphis.usda.gov/sites/default/files/hpai-h5n1-dairy-cattle-mi-epi-invest.pdf*. [Accessed 20 06 2024]

10. Colorado Department of Public Health and Environment. State health officials closely monitor farms responding to avian flu spread in poultry and cows. 20 July 2024 [Available from: *https://cdphe.colorado.gov/press-release/state-health-officials-closely-monitor-farms-responding-to-avian-flu-spread-in*. [Accessed 25 07 2024]

11. US Centers for Disease Control and Prevention. A(H5N1) Bird Flu Response Update, July 19, 2024. 19 July 2024 [Available from: *https://www.cdc.gov/bird-flu/spotlights/h5n1-response-07192024.html*. [Accessed 25 07 2024]

12. U.S Department of Agriculture. Confirmations of Highly Pathogenic Avian Influenza in Commercial and Backyard Flocks. 10 September 2024 [Available from: *https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/commercial-backyard-flocks*. [Accessed 29 08 2024]

13. US Centers for Disease Control and Prevention. Results of Influenza Risk Assessment Tool. 09 August 2024 [Available from: *https://www.cdc.gov/pandemic-flu/php/monitoring/irat-virus-summaries.html*. [Accessed 15 08 2024]

14. World Health Organization. Avian Influenza A(H5N1) - Cambodia. 2 September 2024 [Available from: *https://www.who.int/emergencies/disease-outbreak-news/item/2024-DON533*. [Accessed 05 09 2024]

15. World Health Organization. Avian Influenza A (H5N1) - Australia. 07 June 2024 [Available from: *https://www.who.int/emergencies/disease-outbreak-news/item/2024-DON519*. [Accessed 12 09 2024]

16. World Health Organization. Influenza A(H1N1) variant virus - Viet Nam. 4 September 2024 [Available from: *https://www.who.int/emergencies/disease-outbreak-news/item/2024-DON532*. [Accessed 12 09 2024]

17. US Centers for Disease Control and Prevention. Weekly U.S. Influenza Surveillance Report. [Available from: *https://www.cdc.gov/flu/weekly/index.htm*. [Accessed 29 08 2024]

18. World Health Organization. Influenza at the human-animal interface summary and risk assessment. 19 July 2024. Available from: *https://www.who.int/publications/m/item/influenza-at-the-human-animal-interface-summary-and-assessment-19-july-2024*. [Accessed 01 08 2024]

19. Australian Government. H7 high pathogenicity avian influenza. 26 July 2024 [Available from: *https://www.outbreak.gov.au/current-outbreaks/avian-influenza*. [Accessed 12 09 2024]

20. European Centre for Disease Prevention and Control. Communicable disease threats report, 24-30 August 2024, week 35. 30 August 2024. Available from: *https://www.ecdc.europa.eu/en/publications-data/communicable-disease-threats-report-24-30-august-2024-week-35*. [Accessed 05 09 2024]

21. World Health Organization. Middle East respiratory syndrome coronavirus-Kingdom of Saudi Arabia. 08 May 2024 [Available from: *https://www.who.int/emergencies/disease-outbreak-news/item/2024-DON516*. [Accessed 15 05 2024]