HUMAN EMERGING RESPIRATORY PATHOGENS BULLETIN

MONTHLY SITUATIONAL ANALYSIS OF EMERGING RESPIRATORY DISEASES AFFECTING HUMANS

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IN THIS BULLETIN

The Human Emerging Respiratory Pathogens (HERP) Bulletin is a monthly publication developed by the Public Health Agency of Canada (PHAC)'s Centre for Emerging and Respiratory Infections and Pandemic Preparedness (CERIPP). The HERP Bulletin serves as a mechanism for information sharing on summary surveillance indicators of global, including domestic, public health events affecting humans in the field of emerging respiratory pathogens. This includes pathogens such as novel influenzas (both avian and swine-origin), Middle East Respiratory Syndrome Coronavirus (MERS-CoV), and other ad-hoc emerging respiratory pathogens.

MONTHLY HIGHLIGHTS

EVENTS IN CANADA

No human cases of emerging respiratory infection have been detected in Canada since the last detection in November 2021 (see HERP Bulletin no 59).

INTERNATIONAL EVENTS

During the month of June 2024, the following human cases have been reported internationally (Figure 1):

- One new human case of avian influenza A(H5N6)
- Two new human cases of avian influenza A(H9N2)
- Two new human cases of swine-origin influenza A(H1N2)v

UPDATE ON HUMAN EMERGING RESPIRATORY PATHOGEN PUBLIC HEALTH EVENTS (AS OF JUNE 30, 2024)[1]

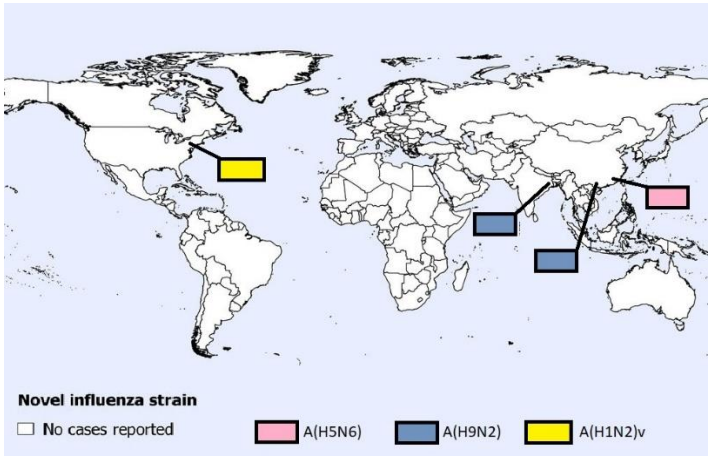
NOVEL INFLUENZA[1]	[N CUMULATIVE CASES[2] (DEATHS), CFR%[3]]	DATE OF LAST REPORT[4]
Avian Influenza		
A(H1N2)[5]	[2 (0), 0%]	January 2019
A(H3N8)	[3 (1), 33%]	March 2023
A(H5N1)	[911 (469), 51%]	May 2024
A(H5N2)	[1(1), 100%]	May 2024
A(H5N6)	[92 (37), 40%]	June 2024
A(H5N8)	[7 (0), 0%]	February 2021
A(H7N4)	[1 (0), 0%]	February 2018
A(H7N9)	[1,568 (615), 39%]	April 2019
A(H9N2)	[130 (2), 2%]	June 2024
A(H10N3)	[3 (0), 0%]	April 2024
A(H10N5)	[1 (1), 100%]	January 2024
Swine Influenza		
A(H1N1)v	[48 (1), 2%]	February 2024
A(H1N2)v	[54 (0), 0%]	June 2024
A(H3NX)v[6]	[1 (0), 0%]	August 2023
A(H3N2)v	[446 (1), <1%]	November 2022
A(H1NX)v[7]	[1 (1), 100%]	November 2021
Eurasian avian-like A(H1N1)v	[11 (0), 0%]	September 2023
MERS-CoV[1]		
Global Case Count[8]	[2,613 (941), 36%]	May 2024
- Within Saudi Arabia[9]	[2,204 (860), 39%]	May 2024

[1]**Date of 1st Reported Case of Human Infection:** MERS-CoV: February 2013 (retrospective case finding September 2012). A(H7N9): March 2013. A(H5N1): 1997. A(H9N2): 1998. A(H5N6): 2014. A(H5N8): December 2020. A(H7N4): February 2018. A(H1N2): March 2018. A(H10N3): May 2021. A(H3N8): April 2022. A(H3N2)v with M gene from pH1N1: 2011. A(H1N2)v: 2005. A(H1N1)v: 2005. EA A(H1N1): 1986, but the above table counts cases from January 2021. A(H10N5): January 2024. A(H5N2): May 2024.

[2]**Cumulative Case Counts:** updated using data reported by the World Health Organization, and the United States Centers for Disease Control and Prevention (US CDC).

[3]**Case Fatality Rate (CFR):** the proportion of cases that resulted in death. Note that this rate is dependent on accurately reported deaths. For events with active cases, this value may be updated retrospectively as final disposition of the cases is known.
[4]**Date of Last Report:** the month and year in which at least one human case of the corresponding pathogen was previously reported.
[5]**A(H1N2)**: virus is a seasonal reassortant of the A(H1N1)pdm09 and A(H3N2) seasonal strains.
[6]**A(H3NX)v:** virus is a novel influenza A(H3) virus with pending, inconclusive, or undetermined neuraminidase results.
[7]**A(H1NX)v:** virus is a novel influenza A(H1) virus with pending, inconclusive, or undetermined neuraminidase results.
[8]**Global Case Count:** cumulative case count and deaths due to MERS-CoV reflect retrospective updates provided in the World Health Organization (WHO) Disease Outbreak News (DON).
[9]**Saudi Arabia**: cumulative case count and deaths due to MERS-CoV in Saudi Arabia reflect retrospective updates provided in the WHO DON.

Figure 1. Spatial distribution of human cases of avian and swine influenza reported globally in June 2024 (n=5).



Note: Map was prepared by CERIPP using data from the latest WHO Event Information Site (EIS) postings. This map reflects data available through these publications as of June 30, 2024.

AVIAN INFLUENZA UPDATES

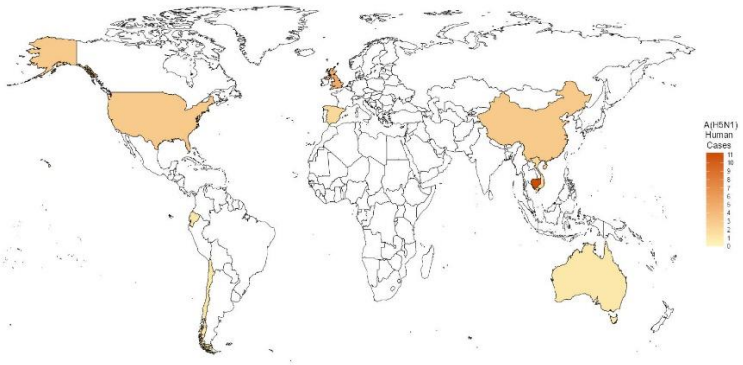
AVIAN INFLUENZA A(H5N1)

The most recent human cases of avian influenza A(H5N1) were reported in May 2024 from Australia (1), China (1), and the United States (2).

In 2024, 11 human cases of avian influenza A(H5N1) have been detected worldwide, from Australia (1), Cambodia (5), China (1), the United States (3), and Vietnam (1). Since the start of the ongoing A(H5N1) worldwide outbreak in poultry and other animals in December 2021, 30 human cases of A(H5N1) have been reported worldwide (2022: n=6, 2023: n=13, 2024: n=11) in Australia (1), Cambodia (11), Chile (1), China (3), Ecuador (1), Spain (2), United Kingdom (5), United States (4), and Vietnam (2) (Figure 2). Of these cases, 15 of the viruses belong to the same strain of A(H5N1) that is associated with the current global outbreak in animals (clade 2.3.4.4b), 1 is tentatively from this same strain, 10 cases were infected with viruses that belonged to a different strain of A(H5N1) (clade 2.3.2.1c), and 1 is from clade 2.3.2.1a. The clade details of two cases from Cambodia and the travel-related case from China are unknown.

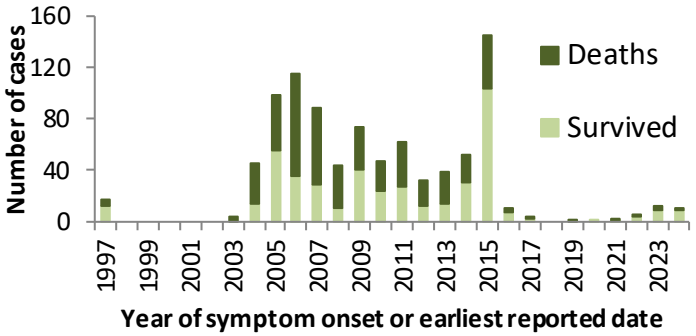
Since the emergence of A(H5N1) in humans in 1997, 911 human cases of A(H5N1) have been reported globally, with a CFR of 51% (Figure 3). In Canada, A(H5N1) detections associated with the current 2021-2024 A(H5N1) clade 2.3.4.4b epizootic have been reported in domestic, backyard, and wild bird populations, as well as other animal species. HPAI A(H5N1) has not been detected in dairy cattle, other livestock in Canada, or in raw milk. No domestically acquired human A(H5N1) infections have ever been reported in Canada; however, in 2014, Canada (Alberta) reported a single fatal case of A(H5N1) in a resident returning from travel in China.

Figure 2. Spatial distribution of human cases of A(H5N1) influenza reported globally from January 1, 2022, to June 30, 2024 (n=30).



Note: Map was prepared by CERIPP using data from the WHO EIS postings, the US CDC's Health Alert Network (HAN), and WHO cumulative case counts. This map reflects data available as of June 30, 2024.

Figure 3. Temporal distribution of human cases of A(H5N1) influenza reported globally, by year, January 1, 1997, to June 30, 2024 (n=911).



Note: Graph was prepared by CERIPP using data from the WHO EIS postings, the US CDC's Health Alert Network (HAN), and WHO cumulative case counts. This graph reflects data available as of June 30, 2024.

AVIAN INFLUENZA A(H5N2)

The most recent human case of avian influenza A(H5N2) was reported in May 2024 from Mexico.

This was the first ever detected human case of A(H5N2). The full spectrum of disease is unknown.

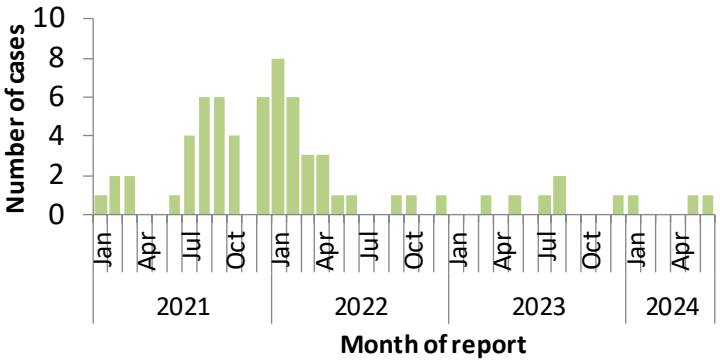
AVIAN INFLUENZA A(H5N6)

One new human case of avian influenza A(H5N6) was reported in June 2024 from China.

The case was a 41-year-old male from Fujian province, who had an illness onset date of May 8, 2024. On May 11, 2024, he was hospitalized with severe pneumonia and subsequently passed away. Prior to illness onset, the case had exposure to backyard poultry. Samples from the environment and close contacts tested negative. No secondary cases were detected.

In 2024, three human cases of avian influenza A(H5N6) were detected globally, all in China. In 2023, six human cases of avian influenza A(H5N6) were detected globally, all in China. Since January 2021, 66 cases of avian influenza A(H5N6) have been reported globally (2021: n=32, 2022: n=25, 2023: n=5, 2024: n=3) (Figure 4); the majority of cases (65) were reported from China and one case was reported from Lao PDR (Figure 4). Since the emergence of this virus in 2014, a total of 92 laboratory-confirmed human cases of avian influenza A(H5N6), including at least 37 deaths, have been reported globally (CFR: 40%). No cases have been reported in Canada.

Figure 4. Temporal distribution of human cases of A(H5N6) influenza reported globally, by month, January 1, 2021, to June 30, 2024 (n=66).



Note: Graph was prepared by CERIPP using data from the WHO EIS postings and the Hong Kong Centre for Health Protection (CHP) press releases. This graph reflects data available as of June 30, 2024.

AVIAN INFLUENZA A(H9N2)

Two new human cases of avian influenza A(H9N2) were reported in June 2024 from India (1) and China (1).

The first case was a 4-year-old male living in West Bengal, India, with an illness onset date of January 26, 2024. On February 1, 2024, the case was admitted to the intensive care unit (ICU) due to the persistence of severe respiratory distress, recurrent high-grade fever, and abdominal cramps. On February 28, 2024, the case was admitted to a different ICU and intubated due to the recurrence of respiratory distress. A nasopharyngeal swab tested positive for influenza A (non-subtyped) and rhinovirus on March 5, 2024. Influenza A(H9N2) was subsequently confirmed by RT-PCR on April 26, 2024. On April 26, 2024, the case was diagnosed with meningoencephalitis associated with viral pneumonia. On May 1, 2024, the case was discharged from the hospital with oxygen support. Prior to illness onset, the case had exposure to domestic poultry. This case was previously diagnosed with hyperreactive airway disorder. However, additional information on comorbidities was not available. It is unknown if the symptom severity in this case is due entirely to the A(H9N2) infection. No secondary cases were detected.

The second case, unrelated to the first case, was a 3-year-old male from Guangxi Zhuang Autonomous Region, China, who had an illness onset date of May 2, 2024. The case experienced mild symptoms. Prior to illness onset, the case had suspected exposure to a live poultry market. Environmental samples tested positive for A(H9) prior to environmental disinfection. Samples from close contacts tested negative and no family clusters were detected.

In 2024, eight human cases of avian influenza A(H9N2) have been reported worldwide, from China (6), India (1), and Vietnam (1). In 2023, a total of 15 human cases of avian influenza A(H9N2) were reported globally, all in China. Since the emergence of avian influenza A(H9N2) in the human population in 1998, 130 cases have been reported worldwide, with a CFR of 2%. No cases have been reported in Canada.

AVIAN INFLUENZA A(H10N3)

The most recent human case of avian influenza A(H10N3) was reported in April 2024 from China.

In 2024, one human case of avian influenza A(H10N3) has been reported worldwide. Since the emergence of avian influenza A(H10N3) in humans in 2021, three human cases have been reported, all from China, with a CFR of 0%. However, with only three human cases reported to date, the full spectrum of disease is highly uncertain. No cases have been reported in Canada.

SWINE INFLUENZA UPDATES

SWINE ORIGIN INFLUENZA A(H1N1)v

The most recent human cases of swine origin influenza A(H1N1)v were reported in February 2024 from Brazil (1) and Spain (1).

In 2024, two human cases of swine origin influenza A(H1N1)v were detected worldwide. There have been five human A(H1N1)v cases reported worldwide in 2023 in Brazil (1), China (2), Spain (1) and Switzerland (1). A total of 48 human cases of A(H1N1)v have been reported globally since 2005, with a 2% CFR. Two A(H1N1)v detections have been reported in Canadian residents since reporting began in 2005, with the first case reported in Ontario in September 2012 and the second case reported in Manitoba in April 2021 (see HERP Bulletin no 52).

SWINE ORIGIN INFLUENZA A(H1N2)v

Two new human cases of swine origin influenza A(H1N2)v were reported in June 2024 from the United States.

The two cases were close contacts and were both detected in Pennsylvania. The cases were ≥18 years of age and sought healthcare during the week of June 16, 2024. One of the cases was hospitalized. The health status of these two cases is unknown as of the time of reporting. Prior to illness onset, both cases had attended a livestock auction where swine were present. Illness among additional close contacts of either case was not identified.

In 2024, three human cases of swine origin influenza A(H1N2)v were detected worldwide, all in the United States. In 2023, four human swine origin influenza A(H1N2)v cases were reported worldwide in Taiwan (1), the UK (1), and the United States (2). A total of 54 human cases of swine origin influenza A(H1N2)v have been reported globally since 2005, with a 0% CFR. Three swine origin influenza A(H1N2)v detections have been reported in Canadian residents since reporting began in 2005. The first case was reported in Alberta in October 2020 (see HERP Bulletin no 46), the second case was reported in Manitoba in April 2021 (see HERP Bulletin no 52) and the latest case in Canada was reported in November 2021 in Manitoba (see HERP Bulletin no 59).

SWINE ORIGIN INFLUENZA A(H3N2/H3NX)v

The most recent human case of swine origin influenza A(H3N2)v was reported in November 2022 from the United States. The most recent human case of swine origin influenza A(H3NX)v was reported in August 2023 from the United States.

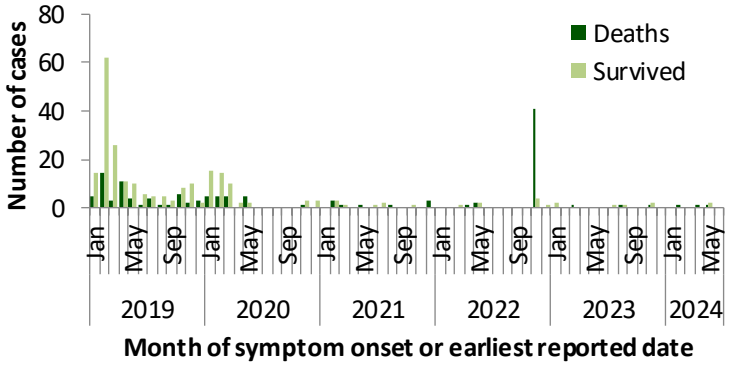
To date, no human cases of swine origin influenza A(H3N2)v have been reported worldwide in 2024. Excluding the reported case of A(H3NX)v in the United States (1), no cases of swine origin influenza A(H3N2)v were detected in 2023. Globally, 446 swine origin influenza A(H3N2)v cases have been reported since 2005, with <1% CFR. Two swine origin influenza A(H3N2)v detections have been reported in Canadian residents since reporting began in 2005, with the latest case reported in June 2021 (see HERP Bulletin no 54).

MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV) UPDATE

The most recent human cases of MERS-CoV were reported in May 2024 from Saudi Arabia.

To date, five new human cases of MERS-CoV have been reported in 2024, all from Saudi Arabia. In 2023, ten cases of MERS-CoV were reported in Oman (1), Saudi Arabia (8), and the United Arab Emirates (1). According to the WHO, 2,613 laboratory-confirmed cases of MERS-CoV, including 941 deaths, have been reported globally since reporting began in 2012 (CFR: 36%) (Figure 5). No cases have ever been reported in Canada.

Figure 5. Temporal distribution of human cases of MERS-CoV reported to the WHO, globally, by month and year, January 1, 2019, to June 30, 2024 (n=334).



Note: Graph was prepared by CERIPP using data from the WHO Disease Outbreak News (DON) and Saudi Arabia's Ministry of Health. This graph reflects data available as of June 30, 2024. The data integrates CERIPP real-time reporting with WHO DON retrospective reporting of MERS-CoV cases and deaths. In November 2022, the WHO published a DON article that updated their counts with retrospective cases and deaths, which resulted in an increase of an additional 5 cases and 41 deaths compared to their previous MERS-CoV-related DON. In August 2023, the WHO published a DON article with case information for three retrospective MERS-CoV cases and two deaths. These three cases and one death were already reflected in the cumulative case count of the DON article published in July 2023, as well as the case totals published in HERP Bulletin no 79. In May 2024, the WHO published a DON article with case information for one single, fatal case of MERS-CoV. This fatal case was already reflected in the case totals published in HERP Bulletin no 88.