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

One (1) human case of avian influenza A(H5N1) was detected in British Columbia, Canada in November 2024.

INTERNATIONAL EVENTS

In November 2024, the following human cases were reported internationally (Figure 1):

- Seven (7) new human cases of avian influenza A(H9N2) in China
- 26 new human cases of avian influenza A(H5) in the US

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

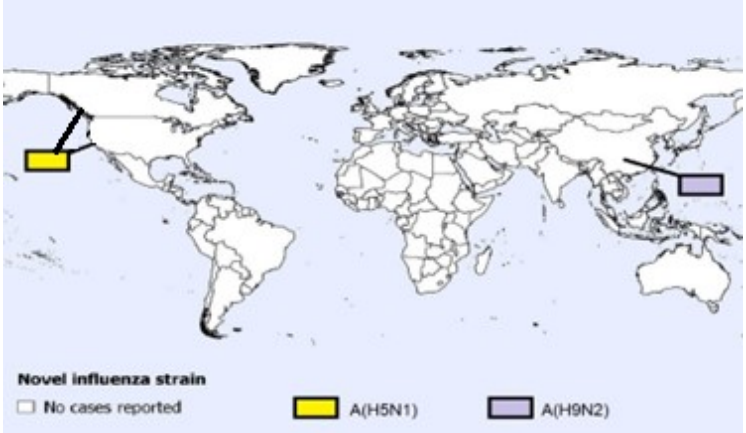
NOVEL INFLUENZA[1]	[N CUMULATIVE CASES[2] (DEATHS), CFR%[3]]	DATE OF LAST REPORT[4]
Avian Influenza		
A(H1N2)[5]	[2 (0), 0%]	January 2019
A(H3N8)	[3 (1), 33%]	March 2023
A(H5NX)[6]	[34 (0), 0%]	November 2024
A(H5N1)	[945 (470), 50%]	November 2024
A(H5N2)	[1(1), 100%]	May 2024
A(H5N6)	[93 (57), 61%]	July 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)	[141(2), 1%]	November 2024
A(H10N3)	[3 (0), 0%]	April 2024
A(H10N5)	[1 (1), 100%]	January 2024
Swine Influenza		
A(H1N1)v	[50 (2), 4%]	August 2024
A(H1N2)v	[55 (0), 0%]	August 2024
A(H3NX)v[7]	[1 (0), 0%]	August 2023
A(H3N2)v	[451 (1), <1%]	September 2024
A(H1NX)v[8]	[1 (1), 100%]	November 2021
Eurasian avian-like A(H1N1)v	[11 (0), 0%]	September 2023
MERS-CoV[1]		
Global Case Count[9]	[2,614 (943), 36%]	September 2024
- Within Saudi Arabia[10]	[2,205 (863), 39%]	September 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: 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. A(H5NX): July 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(H5NX):** virus is a novel influenza A(H3) virus with pending, inconclusive, or undetermined neuraminidase results.
[7]**A(H3NX)v:** virus is a novel influenza A(H3) virus with pending, inconclusive, or undetermined neuraminidase results.
[8]**A(H1NX)v:** virus is a novel influenza A(H1) virus with pending, inconclusive, or undetermined neuraminidase results.
[9]**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).
[10]**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 November 2024 (n=34).



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 November 30, 2024.

AVIAN INFLUENZA UPDATES

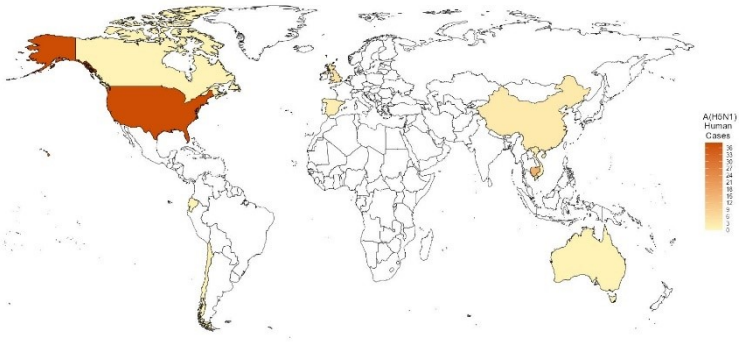
AVIAN INFLUENZA A(H5N1)/A(H5NX)

In November 2024, one (1) new human case of avian influenza A(H5N1) was reported in Canada, in a child <18 years old in British Columbia (BC). The case developed symptoms on November 2, 2024 and sought medical treatment and was hospitalized a few days later. Antivirals were administered and as of November 17, 2024, the case remained in critical, but stable, condition. No specific exposure sources were identified and no further cases were identified in association with this case. Genomic sequencing results reveal the virus is related to avian influenza A(H5N1) viruses detected in birds in BC, which belong to clade 2.3.4.4b, genotype D1.1. The genome contains mutations which may be associated with mammalian adaptation and enhanced replication. Further genomics testing and analyses are underway at both the BC Centre for Disease Controls (BCCDC) Public Health Laboratory and the National Microbiology Laboratory (NML).

Additionally, a total of 26 new human cases of avian influenza A(H5) were reported in the US in November 2024, marking 57 cases reported from the US this year to date. Prior to illness onset, 34/57 (60%) cases reported cattle exposure, 21/57 (37%) reported poultry exposure, and 2/57 (3%) had unknown exposure sources. These cases were reported from seven (7) different states: California (31), Colorado (10), Michigan (2), Missouri (1), Oregon (1), Texas (1), and Washington (11). To date, no fatalities and no person-to-person spread of the virus has been identified in any of the cases reported in the US.

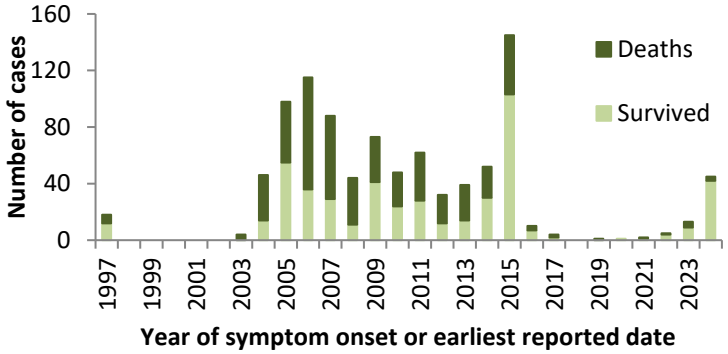
In 2024, 45 human cases of avian influenza A(H5N1) have been detected worldwide, from Australia (1), Canada, (1), Cambodia (10), China (1), the United States (31), and Vietnam (1). This case count does not include A(H5) cases reported in the US without a confirmed N-type. Since the start of the ongoing A(H5N1) worldwide outbreak in poultry and other animals in December 2021, 64 human cases of A(H5N1) have been reported worldwide (2022: n=6, 2023: n=13, 2024: n=45), (Figure 2). A total of 945 human cases of A(H5N1) have been reported globally since the emergence of this pathogen in humans in 1997, with a CFR of 50% (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. Highly pathogenic avian influenza A(H5N1) has not been detected in dairy cattle, other livestock in Canada, or in raw milk. One (1) domestically acquired human A(H5N1) infection was reported in November 2024 and one travel-associated human A(H5N1) infection was reported in a Canadian resident returning from travel in China in 2014.

Figure 2. Spatial distribution of human cases of A(H5N1) influenza reported globally from January 1, 2022, to November 30, 2024 (n=64).



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 November 30, 2024. A(H5) cases reported in the US that are presumed to be A(H5N1) were also included.

Figure 3. Temporal distribution of human cases of A(H5N1) influenza reported globally, by year, January 1, 1997, to November 30, 2024 (n=945).



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 November 30, 2024.

AVIAN INFLUENZA A(H5N2)

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

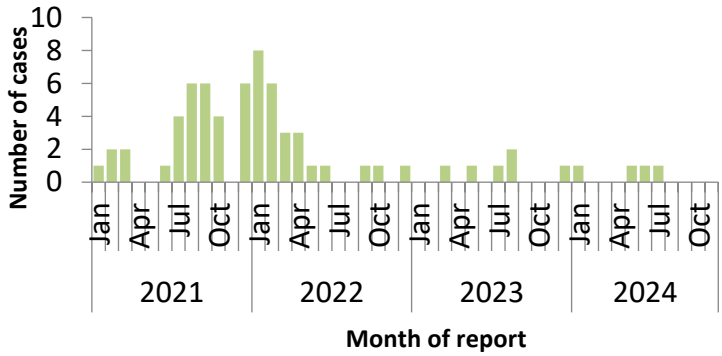
This was the first ever detected human case of A(H5N2). Since only one human case of A(H5N2) has been reported to date and the availability of clinical information is limited, the full spectrum of disease is unknown.

AVIAN INFLUENZA A(H5N6)

The most recent human case of avian influenza A(H5N6) was reported in July 2024 from China.

Since January 2021, 67 cases of avian influenza A(H5N6) have been reported globally (2021: n=32, 2022: n=25, 2023: n=5, 2024: n=4) (Figure 4); all but one case (2021, Lao PDR) were reported in China. Since the emergence of this virus in 2014, a total of 93 laboratory-confirmed human cases of avian influenza A(H5N6), including at least 57 deaths, have been reported globally (CFR: 61%). 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 November 30, 2024 (n=67).



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 November 30, 2024.

AVIAN INFLUENZA A(H9N2)

Seven (7) new human cases of avian influenza A(H9N2) were reported in November 2024 from China. These cases had no known epidemiologic links to one another. Their illness onset dates ranged from September 23, 2024 to October 14, 2024 and the cases were reported from four (4) different regions: Hubei (1), Hunan (4), Jiangxi (1), and Sichuan (1). They range in age from under a year to 67 years and 5/7 (71%) were males. Three (3) cases were hospitalized, but have since recovered. Mild symptoms were reported in the other four (4) cases. All cases reported exposure to poultry prior to illness onset and A(H9) virus was detected in poultry-related environments associated with 6/7 (86%) cases. No further cases were identified in any case contacts.

In 2024, 19 human cases of avian influenza A(H9N2) have been reported worldwide, from China (16), India (1), Vietnam (1), and Ghana (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, 141 cases have been reported worldwide, with a CFR of approximately 1%. 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 August 2024 from the US (1) and Vietnam (1).

In 2024, four human cases of swine origin influenza A(H1N1)v have been 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 50 human cases of A(H1N1)v have been reported globally since 2005, with a 4% 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

The most recent human case of swine origin influenza A(H1N2)v was reported in August 2024 from the US.

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 55 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 cases of swine origin influenza A(H3N2)v were reported in September 2024 from the US.

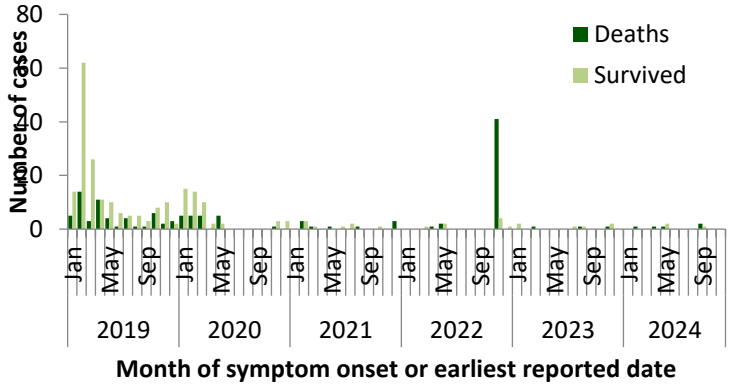
To date, five human cases of swine origin influenza A(H3N2)v have been reported worldwide in 2024, from Canada (1) and the United States (4). Excluding the reported case of A(H3NX)v in the United States (1), no cases of swine origin influenza A(H3N2)v were detected in 2023. Globally, 451 swine origin influenza A(H3N2)v cases have been reported since 2005, with <1% CFR. Four human cases of swine origin influenza A(H3N2)v have been reported in Canada since 2005. The first case of A(H3N2)v in Canada was reported in Ontario in 2005. This was followed by a second case in Ontario in 2016, a third case in Manitoba in June 2021 (see HERP Bulletin no 54), and a fourth case in Saskatchewan in July 2024 (see HERP Bulletin no 91).

MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV) UPDATE

The most recent human case of MERS-CoV was reported in September 2024 from the Kingdom of Saudi Arabia.

To date, six 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, 2,614 laboratory-confirmed cases of MERS-CoV, including 943 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 November 30, 2024 (n=335).



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 November 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.