



HUMAN EMERGING RESPIRATORY PATHOGENS BULLETIN

MONTHLY SITUATIONAL ANALYSIS OF EMERGING RESPIRATORY DISEASES AFFECTING HUMANS

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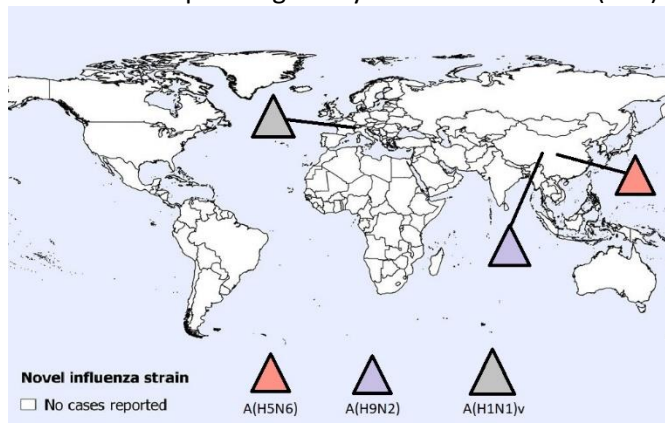
The Human Emerging Respiratory Pathogens (HERP) Bulletin is a monthly publication developed by the Public Health Agency of Canada (PHAC)'s Centre for Emerging and Respiratory Infections and Pandemic Preparedness (CERIPP). The HERP Bulletin serves as a mechanism for information sharing on summary surveillance indicators of global 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

During the month of December 2023, the following human cases have been reported:

- One new human case of avian influenza [A\(H5N6\)](#)
- Two new human cases of avian influenza [A\(H9N2\)](#)
- One new human case of swine origin influenza [A\(H1N1\)v](#)
- Three new human cases of [MERS-CoV](#)

Figure 1. Spatial distribution of human cases of avian and swine influenza reported globally in December 2023 (n=4).



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 December 31, 2023.

UPDATE ON HUMAN EMERGING RESPIRATORY PATHOGEN PUBLIC HEALTH EVENTS (AS OF DECEMBER 31, 2023)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%]	August 2023
A(H5N1)	[900 (467), 52%]	November 2023
A(H5N6)	[89 (34), 38%]	December 2023
A(H5N8)	[7 (0), 0%]	February 2021
A(H7N4)	[1 (0), 0%]	February 2018
A(H7N9)	[1,568 (615), 39%]	April 2019
A(H9N2)	[122 (2), 2%]	December 2023
A(H10N3)	[2 (0), 0%]	September 2022
Swine Influenza		
A(H1N1)v	[46 (1), 2%]	December 2023
A(H1N2)v	[51 (0), 0%]	November 2023
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-CoV¹		
Global Case Count ⁸	[2,608 (938), 36%]	December 2023
- Within Saudi Arabia ⁹	[2,199 (857), 39%]	December 2023

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.



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.

AVIAN INFLUENZA UPDATES

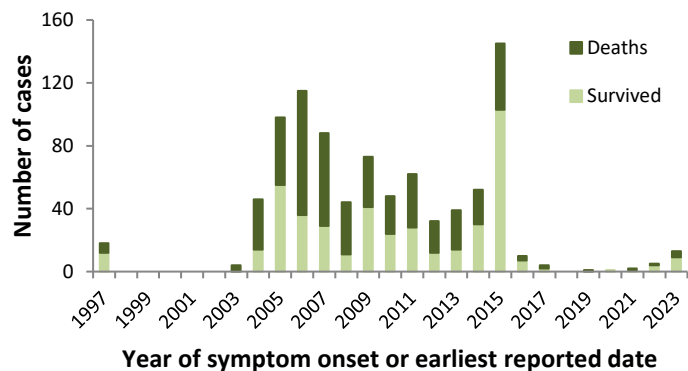
AVIAN INFLUENZA A(H5N1)

The most recent human cases of avian influenza A(H5N1) were reported in November 2023 from Cambodia.

In 2023, 13 human cases of avian influenza A(H5N1) have been detected worldwide. This case count for 2023 represents an increase compared to the 6 reported human cases from January 2022 to December 2022. Since 2022, 19 human cases of A(H5N1) have been reported worldwide (2022: n=6, 2023: n=13) in Cambodia (6), Chile (1), China (2), Ecuador (1), Spain (2), United Kingdom (5), United States (1), Vietnam (1). Of these cases, 13 belonged to clade 2.3.4.4b and 6 belonged to clade 2.3.2.1c (Cambodia). Since the emergence of A(H5N1) in humans in 1997, 900 human cases of A(H5N1) have been reported globally, with a CFR of 52%.

In Canada, A(H5N1) detections associated with the current 2021-2023 A(H5N1) clade 2.3.4.4b epizootic have been reported in domestic, backyard, and wild bird populations, as well as other animal species. No domestically acquired human A(H5N1) infections have been reported in Canada. In 2014, Canada (Alberta) reported a single fatal case of A(H5N1) in a resident returning from travel in China.

Figure 2. Temporal distribution of human cases of A(H5N1) influenza reported globally, by year, January 1, 1997, to December 31, 2023 (n=900).



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 December 31, 2023.

AVIAN INFLUENZA A(H5N6)

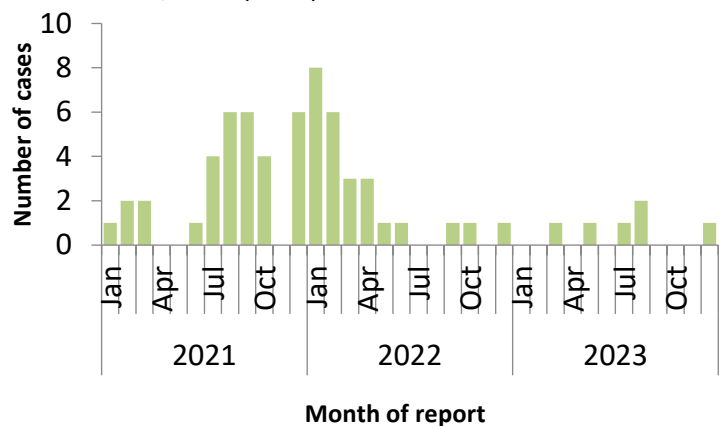
One new human case of A(H5N6) was reported in December 2023 from China.

The case is a 33-year-old female farmer from Bazhong city, Sichuan province, China. She had an illness onset date of October 20, 2023, was hospitalized with severe pneumonia on October 22, 2023 and died on November 14, 2023. She had hypothyroidism as a comorbidity and had visited a live poultry market prior to illness onset.

At the time of last report no family members have developed symptoms. Samples from close contacts tested negative for influenza and environmental samples tested negative.

In 2023, 6 human cases of avian influenza A(H5N6) have been detected, all in China. This case count for 2023 represents a decrease compared to the 25 reported human cases from January 2022 to December 2022. Since January 2021, 63 cases of avian influenza A(H5N6) have been reported globally (32 cases were reported in 2021, 25 cases in 2022 and 5 cases in 2023) (Figure 4); the majority of cases (62) were reported from China and one case was reported from Lao PDR (Figure 3). Since the emergence of this virus in 2014, a total of 89 laboratory-confirmed human cases of avian influenza A(H5N6), including at least 34 deaths, have been reported globally (CFR: 38%). No cases have been reported in Canada.

Figure 3. Temporal distribution of human cases of A(H5N6) influenza reported globally, by month, January 1, 2021, to December 31, 2023 (n=63).



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 December 31, 2023.

Figure 4. Spatial distribution of human cases of A(H5N6) influenza reported in China and Lao PDR from January 1, 2021, to December 31, 2023 (n=63).



Note: Map was prepared by CERIPP using data from the WHO EIS postings and the Hong Kong CHP press releases. This map reflects data available through these publications as of December 31, 2023.

AVIAN INFLUENZA A(H9N2)

Two new human cases of avian influenza A(H9N2) were reported in December 2023 from China.

The first (index) case was a 1-year-old male from Sichuan province with an illness onset date of November 14, 2023. He experienced mild illness and was not hospitalized. This case was detected through influenza-like-illness surveillance.

The second case was a 74-year-old female from Sichuan province who had an illness onset date of November 5, 2023. She developed mild illness and was not hospitalized. This case was detected during tracing of close contacts and testing for the index case. The cases were neighbours.

Both cases had contact to sick backyard chickens prior to illness onset. 12 samples were collected from close contacts, 11 tested negative and one tested positive (the second case described above) for A(H9N2). and environmental samples from around the cases' homes tested positive for A(H9).

Currently available information indicates that there is no epidemiological link between the cases, and both were infected following exposure to infected backyard poultry.

In 2023, a total of 15 human cases of avian influenza A(H9N2) have been reported globally, all in China. This case count for 2023 represents a decrease compared to the 21 reported human cases from January 2022 to December 2022. Since the emergence of this virus in the human population in 1998, 122 cases have been reported worldwide, with a CFR of 2%. No cases have been reported in Canada.

SWINE INFLUENZA UPDATES

SWINE ORIGIN INFLUENZA A(H1N1)v

One new case of swine origin influenza A(H1N1)v was reported in December 2023 from Switzerland.

The case is a male farm working living in Lucerne, Switzerland with illness onset of November 14, 2023 and was detected on November 27, 2023 as part of a surveillance project on influenza at the human-animal interface. The case experienced mild symptoms and has since recovered. The case had direct occupational exposure to swine prior to illness onset. Pigs on the swine farm tested positive for swine influenza A. Sequencing results indicate that this virus is an A(H1N1)v strain of clade 1C.2.2. Further viral characterization is ongoing. This strain has been detected in a human in Germany in 2022 as well as in the swine population in Switzerland and other European countries (France, Germany,

United Kingdom) within the last two years. Four household contacts were identified with two reporting symptoms of illness. All four household contacts were tested by RT-PCR on December 4, 2023 and were negative for influenza A and influenza B.

There have been 5 human A(H1N1)v cases reported worldwide in 2023 in Brazil (1), China (2), Spain (1) and Switzerland (1). This case count for 2023 represents a slight increase compared to the 4 reported human cases from January 2022 to December 2022. A total of 46 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

The most recent human case of swine origin influenza A(H1N2)v was reported in November 2023 from the United Kingdom (UK).

There have been 4 human swine origin influenza A(H1N2)v cases reported worldwide in 2023 in Taiwan (1), the UK (1), and the United States (2). This case count for 2023 represents a decrease compared to the 8 reported human cases from January 2022 to December 2022. A total of 50 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.

Excluding the reported case of A(H3NX)v in the United States (1), no cases of swine origin influenza A(H3N2)v have been detected in 2023. This case count for 2023 represents a decrease compared to the 5 reported human cases from

January 2022 to December 2022. 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](#)).

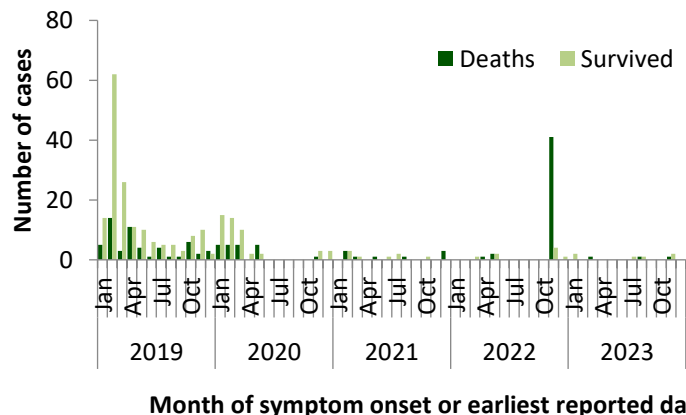
MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV) UPDATE

The most recent human cases of MERS-CoV were reported in November 2023 from Saudi Arabia.

The Food and Agriculture Organization (FAO) of the United Nations reported three new Middle-East respiratory syndrome coronavirus (MERS-CoV) cases and one fatality that were reported from Saudi Arabia between October 19 – November 16, 2023. No additional case details were reported.

In 2023, 10 cases of MERS-CoV were reported in Oman (1), Saudi Arabia (8), and the United Arab Emirates (1). This case count for 2023 represents an increase compared to the 7 reported human cases from January 2022 to December 2022 but is lower than the yearly average case count reported within the past three years. According to the WHO, 2,608 laboratory-confirmed cases of MERS-CoV, including 938 deaths, have been reported globally since reporting began in 2012 (CFR: 36%). 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 December 31, 2023 (n=329).



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

December 31, 2023. 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](#).