



HUMAN EMERGING RESPIRATORY PATHOGENS BULLETIN

MONTHLY SITUATIONAL ANALYSIS OF EMERGING RESPIRATORY DISEASES AFFECTING HUMANS

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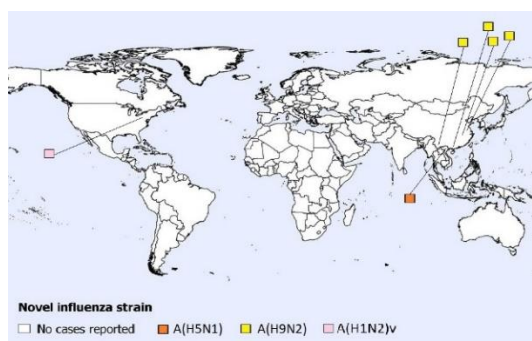
The Human Emerging Respiratory Pathogens (HERP) Bulletin is a monthly publication developed by the Public Health Agency of Canada (PHAC)'s Centre for Emerging and Respiratory Infections and Pandemic Preparedness (CERIPP). The HERP Bulletin serves as a mechanism for information sharing on summary surveillance 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 March 2024, the following human cases have been reported (Figure 1):

- One new human case of avian influenza [A\(H5N1\)](#)
- Four new human cases of avian influenza [A\(H9N2\)](#)
- One new human case of swine-origin influenza [A\(H1N2\)v](#)

Figure 1. Spatial distribution of human cases of avian and swine influenza reported globally in March 2024 (n=6).



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 March 31, 2024.

UPDATE ON HUMAN EMERGING RESPIRATORY PATHOGEN PUBLIC HEALTH EVENTS (AS OF MARCH 31, 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)	[906 (469), 52%]	March 2024
A(H5N6)	[90 (35), 39%]	January 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)	[127 (2), 2%]	March 2024
A(H10N3)	[2 (0), 0%]	September 2022
A(H10N5)	[1 (1), 100%]	January 2024
Swine Influenza		
A(H1N1)v	[48 (1), 2%]	February 2024
A(H1N2)v	[52 (0), 0%]	March 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-CoV¹		
Global Case Count ⁸	[2,609 (939), 36%]	February 2024
- Within Saudi Arabia ⁹	[2,200 (858), 39%]	February 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.

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.



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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)

One new fatal human case of avian influenza A(H5N1) was reported in March 2024, in Vietnam.

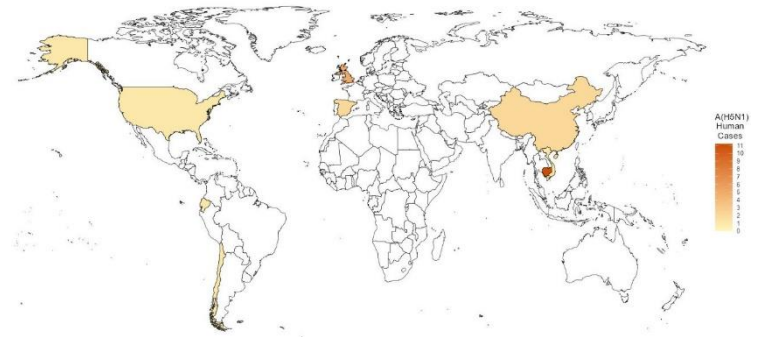
The case was a 21-year-old male from Khanh Hoa province with no underlying medical conditions. He first experienced illness onset (fever, cough) on March 11, 2024. The case's symptoms persisted and he developed abdominal pain and diarrhea, so he was hospitalized on March 15, 2024. His condition continued to worsen and he was transferred twice more. First, he was transferred to a provincial hospital's ICU. After test results returned positive for influenza A(H5), he was then transferred to the Provincial Hospital of Tropical Diseases. The case received oseltamivir, but his condition continued to deteriorate until his death on March 23, 2024. Public health investigations revealed the case had trapped wild birds prior to illness onset. No further cases have been detected amongst monitored and tested case contacts.

In 2024, six human cases of avian influenza A(H5N1) have been detected worldwide, mostly from Cambodia (5/6). Since 2022, 25 human cases of A(H5N1) have been reported worldwide (2022: n=6, 2023: n=13, 2024: n=6) in Cambodia (11), Chile (1), China (2), Ecuador (1), Spain (2), United Kingdom (5), United States (1), and Vietnam (2) (Figure 2). Of these cases, 13 (including one death) belonged to clade 2.3.4.4b and nine cases (including five deaths) belonged to clade 2.3.2.1c. The clade details of three of the cases (two from Cambodia and one from Vietnam) are unknown. The A(H5N1) clade 2.3.2.1c detected in Cambodia is different from the clade A(H5N1) 2.3.4.4b that is predominantly circulating worldwide, including in Canada.

Since the emergence of A(H5N1) in humans in 1997, 906 human cases of A(H5N1) have been reported globally, with a CFR of 52% (Figure 3). In Canada, A(H5N1) detections associated with the current 2021-2024 A(H5N1) clade

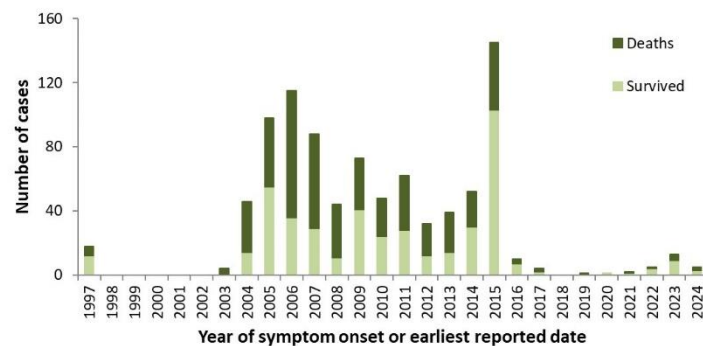
2.3.4.4b epizootic have been reported in domestic, backyard, and wild bird populations, as well as other animal species. No domestically acquired human A(H5N1) infections have ever been reported in Canada; however, in 2014, Canada (Alberta) reported a single fatal case of A(H5N1) in a resident returning from travel in China.

Figure 2. Spatial distribution of human cases of A(H5N1) influenza reported globally from January 1, 2022, to March 31, 2024 (n=25).



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 March 31, 2024.

Figure 3. Temporal distribution of human cases of A(H5N1) influenza reported globally, by year, January 1, 1997, to March 31, 2024 (n=906).



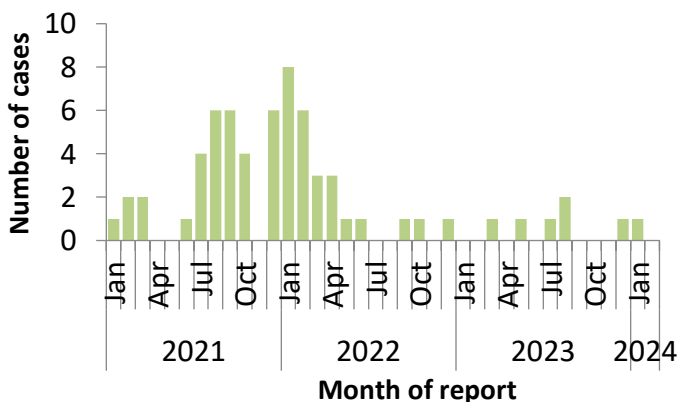
Note: Graph was prepared by CERIPP using data from the WHO EIS postings, the US CDC's Health Alert Network (HAN), and WHO cumulative case counts. This graph reflects data available as of March 31, 2024.

AVIAN INFLUENZA A(H5N6)

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

In 2024, one human case of avian influenza A(H5N6) was detected worldwide. In 2023, six human cases of avian influenza A(H5N6) were detected, all in China. Since January 2021, 64 cases of avian influenza A(H5N6) have been reported globally (2021: n=32, 2022: n=25, 2023: n=5, 2024: n=1) (Figure 4); the majority of cases (63) 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 90 laboratory-confirmed human cases of avian influenza A(H5N6), including at least 35 deaths, have been reported globally (CFR: 39%). 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 March 31, 2024 (n=64).



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 March 31, 2024.

AVIAN INFLUENZA A(H9N2)

Four new human cases of avian influenza A(H9N2) were reported in March 2024 from China.

Three human cases of avian influenza A(H9N2) were reported on March 4, 2024. No known epidemiologic link exists between these cases and no secondary cases were identified. The first case was a 3-year-old from Guangxi province, the second case was a 11-year-old from Jiangxi province, and the third case was a 3-year-old from Guangdong province. All cases were male, developed illness and were hospitalized in

February 2024, and reported exposure to backyard poultry or a live poultry market prior to illness onset. At the time of last report, one case was in severe condition and the other two cases were in mild condition.

On March 12, 2024, one more human case of avian influenza A(H9N2) was reported in a 6-year-old male from Anhui province. This case developed symptoms on January 3, 2024 and no additional event details were provided.

In 2024, five human cases of avian influenza A(H9N2) have been reported worldwide, all from China. 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, 127 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

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

One new human case of swine-origin influenza A(H1N2)v was reported in March 2024, in the United States (US). The case was <18 years old and from Pennsylvania. The case sought healthcare, was hospitalized, and has since recovered. According to public health investigations, the case had contact with swine prior to illness onset. Mild illness was identified in two case contacts; however, they also reported exposure to swine prior to the case's illness onset. No person-to-person transmission of A(H1N2)v associated with this case was identified.

This is the first human case of swine origin influenza A(H1N2)v that has been reported in 2024. 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 52 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.

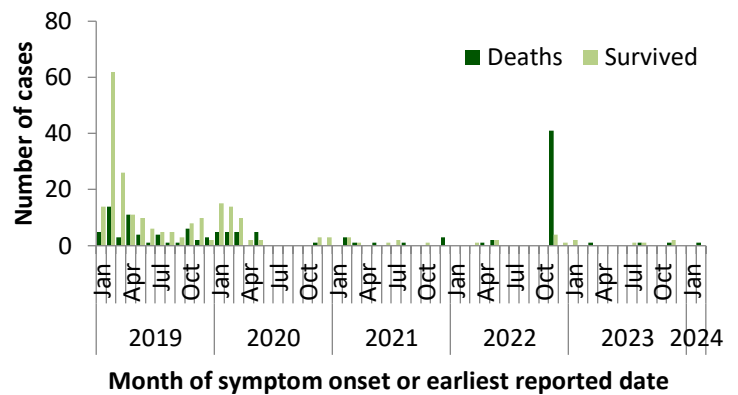
To date, no human cases of swine origin influenza A(H3N2)v have been reported worldwide in 2024. Excluding the reported case of A(H3NX)v in the United States (1), no cases of swine origin influenza A(H3N2)v were detected in 2023. Globally, 446 swine origin influenza A(H3N2)v cases have been reported 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 case of MERS-CoV was reported in February 2024.

To date, one new human case of MERS-CoV has been reported in 2024. 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, 2,609 laboratory-confirmed cases of MERS-CoV, including 939 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 March 31, 2024 (n=330).



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 March 31, 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](#).