



HUMAN EMERGING RESPIRATORY PATHOGENS BULLETIN

MONTHLY SITUATIONAL ANALYSIS OF EMERGING RESPIRATORY DISEASES AFFECTING HUMANS

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UPDATE ON HUMAN EMERGING RESPIRATORY PATHOGEN PUBLIC HEALTH EVENTS (AS OF FEBRUARY 28, 2023)¹

COVID-19 UPDATE

On December 31, 2019, cases of a pneumonia of unknown etiology were reported in Wuhan, China. These cases were determined to be due to a novel coronavirus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes coronavirus disease 2019 (COVID-19). On January 30, 2020, the World Health Organization (WHO) first declared the outbreak a Public Health Emergency of International Concern (PHEIC). On March 11, 2020, the WHO characterized the outbreak as a global pandemic. The WHO Director-General convened the International Health Regulations (IHR) Emergency Committee (EC) on COVID-19 fourteen (14) times through 2020 to 2023, continually assessing that COVID-19 constitutes a PHEIC.

The Public Health Agency of Canada is monitoring the situation closely. For the most up-to-date information, please visit:

<https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html>

AVIAN INFLUENZA UPDATES

AVIAN INFLUENZA A(H9N2)

The most recent human case of avian influenza A(H9N2) was reported in December 2022 from China.

In 2022, 21 human cases of avian influenza A(H9N2) were reported worldwide. So far, no human cases of A(H9N2) have been reported in 2023. Since the emergence of this virus in the human population in 1998, 107 cases have been reported worldwide, with a case fatality rate (*CFR) of 2%. No cases have been reported in Canada.

*CFR: case fatality rate. 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.

NOVEL INFLUENZA ¹	[N CUMULATIVE CASES ² (DEATHS), CFR% ³]
A(H7N9)	[1,568 (615), 39%]
A(H5NX) ⁴	[2(0), 0%]
A(H5N1)	[888 (464), 52%]
A(H9N2)	[107 (2), 2%]
A(H5N6)	[83 (33), 40%]
A(H5N8)	[7 (0), 0%]
A(H7N4)	[1 (0), 0%]
A(H1N2) ⁵	[2 (0), 0%]
A(H10N3)	[2 (0), 0%]
A(H3N8)	[2 (0), 0%]
A(H3N2)v	[446 (1), <1%]
A(H1N2)v	[47 (0), 0%]
A(H1N1)v	[42 (0), 0%]
A(H1NX) ⁶	[1 (1), 100%]
Eurasian avian-like A(H1N1)	[10 (0), 0%]

MERS-CoV¹

Global Case Count ⁷	[2,603 (935), 36%]
Saudi Arabia ⁸	[2,195 (854), 39%]

¹Date 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.

²Cumulative Case Counts: updated using data reported by the World Health Organization (avian and swine influenza, MERS CoV), and the United States Centers for Disease Control and Prevention (US CDC) (swine influenza).

³Case Fatality Rate (CFR): the proportion of cases that resulted in death. For events with active cases, may be updated retrospectively as final disposition is known.

⁴A(H5NX): virus is an A(H5) virus with pending, inconclusive, or undetermined neuraminidase results.

⁵A(H1N2): virus is a seasonal reassortant of the A(H1N1)pdm09 and A(H3N2) seasonal strains.

⁶A(H1NX): virus is a novel influenza A(H1) virus with pending, inconclusive, or undetermined neuraminidase results.

⁷Global 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).

⁸Saudi Arabia: cumulative case count and deaths due to MERS-CoV in Saudi Arabia reflect retrospective updates provided in the WHO DON.



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AVIAN INFLUENZA A(H5N6)

The most recent human case of avian influenza A(H5N6) was reported in December 2022 from China.

A total of 83 laboratory-confirmed human cases of avian influenza A(H5N6), including at least 33 deaths (CFR: 40%) have been reported globally since 2014. Since January 2021, 57 cases of avian influenza A(H5N6) have been reported globally (Figure 2); 56 A(H5N6) cases were reported from China and one (1) case was reported from Lao PDR (Figure 3). In 2022, 25 A(H5N6) human cases were reported worldwide. So far, no human cases of A(H5N6) have been reported in 2023. No cases have been reported in Canadian residents.

AVIAN INFLUENZA A(H5N1)/A(H5NX)

Two (2) new human cases of avian influenza A(H5N1) were detected in February 2023 in Prey Veng province, Cambodia.

The first case was detected on February 22, 2023, in an 11-year-old female with an illness onset date of February 16, 2023, with fever, sore throat, and cough. The case received treatment at the local level and subsequently was sent to the National Children's Hospital in Phnom Penh with severe pneumonia for further treatment. The case died on February 22, 2023. The genetic sequence data of the virus from both cases were uploaded to the Global Initiative on Sharing All Influenza Data (GISAID) database, showing they both belong to clade 2.3.2.1c, which has been circulating in poultry in southeast Asia since 2014. The 2.3.2.1c viruses in Cambodia are different from H5N1 viruses currently circulating in wild birds and poultry in Canada and other countries, which are H5 clade 2.3.4.4b.

The second case was detected on February 24, 2023 and is the father of the first case. He is a 49-year-old male who reported fever and cough, and stayed in isolation at the referral hospital. He tested negative on February 27, 2023 and was released from the hospital on February 28, 2023.

An outbreak investigation determined the exposure of these two reported cases to the virus were from infected birds from the village. There was no human-to-human transmission between the father and daughter. The cases had animals (22 chickens, 3 ducks) at their home that recently died. There have also been an unusual number of deaths among wild birds in that area. The investigation team collected a total of 29 samples [16 close contacts, including the first case's father, and 13 with influenza-like-illness (ILI)]. Other than the sample from the asymptomatic father, all of the samples tested negative.

Since the emergence of A(H5N1) in humans in 1997, 888 human cases of A(H5N1) have been reported globally, with a CFR of 52%. No domestically acquired A(H5N1) infections have ever been reported in Canada. In 2014, Canada (Alberta) reported one single fatal case of A(H5N1) in a resident returning from travel in China.

According to a risk assessment published by the World Health Organization (WHO) in a Disease Outbreak News (DON) post on February 26, 2023, based on evidence so far, the virus does not infect humans easily and spread from person-to-person appears to be unusual. Since the virus continues to be detected in poultry populations, further human cases can be expected.

SWINE INFLUENZA UPDATES

SWINE ORIGIN INFLUENZA A(H1N2)v

The most recent human case of swine origin influenza A(H1N2)v was reported in December 2022 from Taiwan.

A total of 47 A(H1N2)v cases have been reported globally since 2005, with a 0% CFR.

Eight (8) A(H1N2)v cases were reported worldwide in 2022. So far, no human cases of A(H1N2)v have been reported in 2023. Three (3) A(H1N2)v detections have been reported in Canadian residents since reporting began in 2005, and the latest case in Canada was reported in November 2021 from Manitoba.

SWINE ORIGIN INFLUENZA A(H3N2)v

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

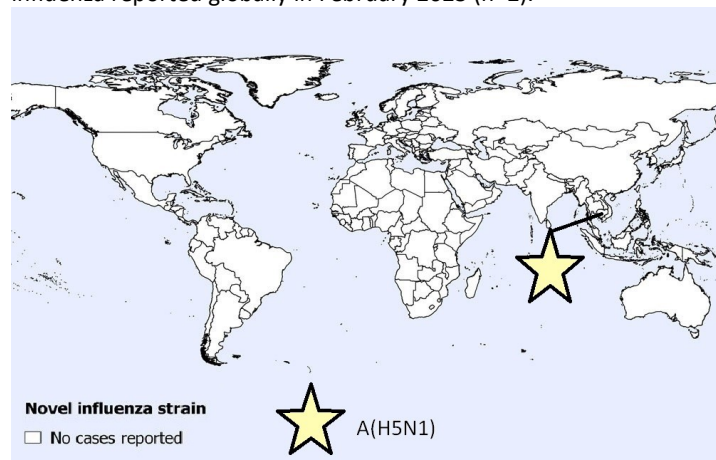
Globally, 446 A(H3N2)v cases have been reported since 2005, with <1% CFR. Five (5) A(H3N2)v cases were reported worldwide in 2022. Two (2) A(H3N2)v detections have been reported in Canadian residents since reporting began in 2005, with the latest case reported in June 2021.

SWINE ORIGIN INFLUENZA A(H1N1)v

The most recent human case of swine origin influenza A(H1N1)v was reported in January 2023 from Spain.

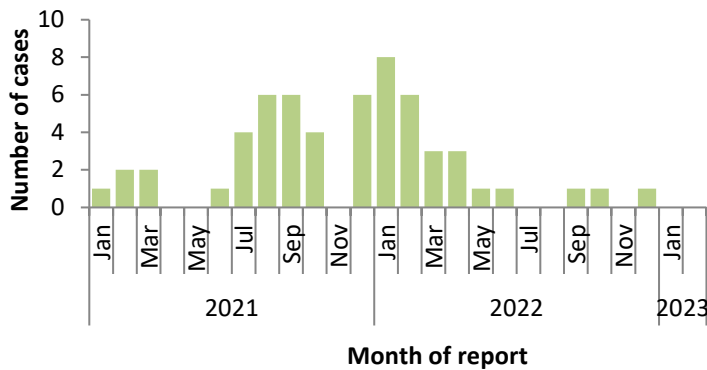
Globally, 42 human cases of A(H1N1)v have been reported since 2005, with no associated fatalities. In 2022, four (4) A(H1N1)v cases were reported worldwide. So far, one (1) A(H1N1)v case has been reported worldwide in 2023. Two (2) A(H1N1)v detections have been reported in Canadian residents since reporting began in 2005, with the latest case reported in April 2021.

Figure 1. Spatial distribution of human cases of avian and swine influenza reported globally in February 2023 (n=2).



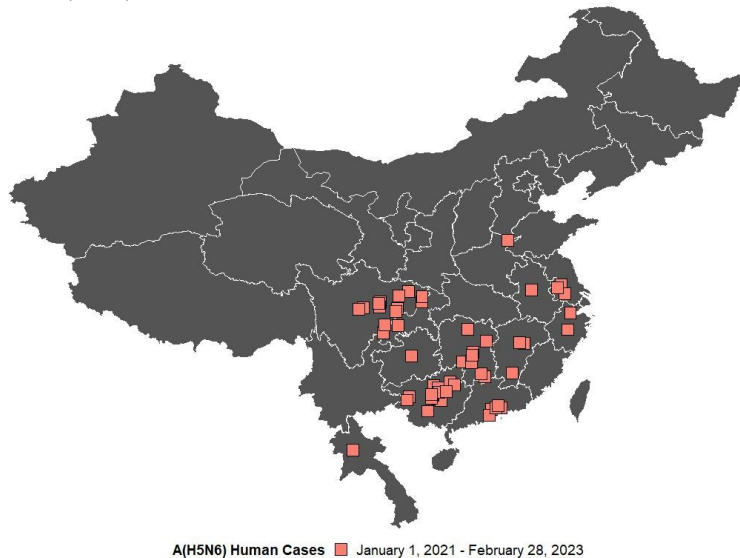
Note: Map was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the latest WHO Event Information Site (EIS) postings. This map reflects data available through these publications as of February 28, 2023.

Figure 2. Temporal distribution of human cases of A(H5N6) influenza reported globally, by month, January 1, 2021, to February 28, 2023 (n=57).



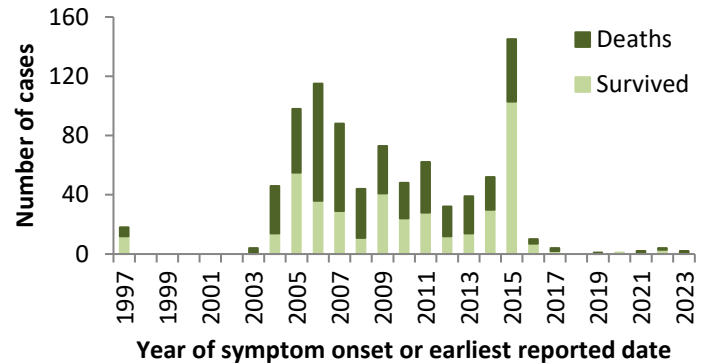
Note: Graph was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the WHO EIS postings and the Hong Kong Centre for Health Protection (CHP) press releases. This graph reflects data available as of February 28, 2023.

Figure 3. Spatial distribution of human cases of A(H5N6) influenza reported in China and Lao PDR from January 1, 2021, to February 28, 2023 (n=57).



Note: Map was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the WHO EIS postings and the Hong Kong Centre for Health Protection (CHP) press releases. This map reflects data available through these publications as of February 28, 2023.

Figure 4. Temporal distribution of human cases of A(H5N1) influenza reported globally, by year, January 1, 1997, to February 28, 2023 (n=888).



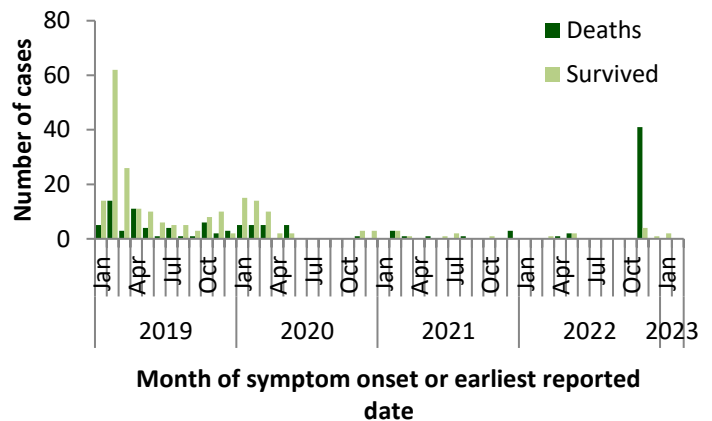
Note: Graph was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the WHO EIS postings, the US CDC's Health Alert Network (HAN), and WHO cumulative case counts. This graph reflects data available as of February 28, 2023.

MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV) UPDATE

The most recent human cases of MERS-CoV were reported in January 2023 from Saudi Arabia (1) and from Oman (1).

According to the WHO, 2,603 laboratory-confirmed cases of MERS-CoV, including 935 deaths, have been reported globally since reporting began in 2012 (CFR: 36%). Two (2) MERS-CoV cases have been reported globally in 2023. 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 February 28, 2023 (n=321).



Note: Graph was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the WHO Disease Outbreak News (DON) and Saudi Arabia's Ministry of Health. This graph reflects data available as of February 28, 2023. The data integrates CIRID real-time reporting with WHO DON retrospective reporting of MERS-CoV cases and deaths. In November 2022, the WHO published a Disease Outbreak News (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.