



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 MARCH 31, 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 14 times from 2020 through 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)

Seven (7) new human cases of avian influenza A (H9N2) were reported in March 2023 from China.

Between September 20, 2022, to February 2023, seven (7) new A(H9N2) human infections have been identified. Four (4) of the cases developed mild illness, one (1) case developed severe illness, and no severity information was available for the other two (2) cases. Four (4) cases reported exposure to poultry prior to illness onset, two (2) cases reported no exposure, and one (1) case had unknown exposure(s).

Since the emergence of this virus in the human population in 1998, 114 cases have been reported worldwide, with a case fatality rate (*CFR) of 2%. No cases have been reported in Canada.

NOVEL INFLUENZA¹

	[N CUMULATIVE CASES ² (DEATHS), CFR% ³]
A(H7N9)	[1,568 (615), 39%]
A(H5N1)	[891 (464), 52%]
A(H5NX) ⁴	[1 (0), 0%]
A(H9N2)	[114 (2), 2%]
A(H5N6)	[84 (33), 39%]
A(H5N8)	[7 (0), 0%]
A(H7N4)	[1 (0), 0%]
A(H1N2) ⁵	[2 (0), 0%]
A(H10N3)	[2 (0), 0%]
A(H3N8)	[3 (1), 33%]
A(H3N2)v	[446 (1), <1%]
A(H1N2)v	[47 (0), 0%]
A(H1N1)v	[44 (0), 0%]
A(H1NX) ⁶	[1 (1), 100%]
Eurasian avian-like A(H1N1)	[10 (0), 0%]

MERS-CoV¹

Global Case Count ⁷	[2,604 (936), 36%]
Saudi Arabia ⁸	[2,196 (855), 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: 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.

*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.



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AVIAN INFLUENZA A(H5N6)

One (1) new human case of A (H5N6) was reported in March 2023 in Guangdong Province, China. The case is in a 49-year-old male with a symptom onset date of December 17, 2022. The case was admitted for treatment in serious condition. Prior to illness onset, the case had contact with live domestic poultry.

A total of 84 laboratory-confirmed human cases of avian influenza A(H5N6), including at least 33 deaths (CFR: 39%) have been reported globally since 2014. Since January 2021, 58 cases of avian influenza A(H5N6) have been reported globally (Figure 2); 57 A(H5N6) cases were reported from China and one (1) case was reported from Lao PDR (Figure 3). No cases have been reported in Canadian residents.

AVIAN INFLUENZA A(H5N1)/(H5NX)

Two (2) new human cases of avian influenza A(H5N1)/(H5NX) were detected in March 2023 in Jiangsu Province, China and Northern Chile.

One (1) case of A(H5N1) was detected in a 53-year-old female from Jiangsu Province, China with an illness onset date of January 31, 2023. She was hospitalized in serious condition. Prior to illness onset, the case had exposure to poultry.

One (1) case of A(H5NX) was detected in a 53-year-old male from Tocopilla, Antofagasta, Chile with an illness onset date of March 13, 2023. On March 22, 2023, the case was hospitalized in the Intensive Care Unit and was on mechanical ventilation at the time of last report. The source of exposure and whether there is a history of others affected in the patient's environment is being investigated. The most plausible hypothesis of transmission was through environmental exposure given that between December 2022 and February 2023, highly pathogenic avian influenza (HPAI) was detected in wild birds where the case resides. There was also a massive death of sea lions on the beach located 100 meters from the patient's home, as well as the presence of birds detected in the vicinity and interior of the winery he used as a workshop.

Further laboratory information for the A(H5NX) cases from Vietnam and Ecuador confirmed the N-type of the virus as N1. These cases are considered as human cases of infection with an influenza A(H5N1) virus.

The genetic sequence data of the virus from the cases of A(H5N1) in Ecuador and Jiangsu Province, China were uploaded to the Global Initiative on Sharing All Influenza Data (GISAID) database indicating the virus belongs to clade 2.3.4.4b.

Since the emergence of A(H5N1) in humans in 1997, 891 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.

AVIAN INFLUENZA A(H3N8)

One (1) new case of A(H3N8) was reported from Zhongshan city, Guangdong Province, China. The case is a 56-year-old female with underlying conditions with illness onset date of February 22, 2023. She was hospitalized for severe pneumonia and subsequently died on March 3, 2023. She had history of exposure to live poultry and wild bird activities around her home. Experts believe that this case is a sporadic

case. The risk of virus transmission is low at this stage with no indication of human-to-human transmission. No close contacts of the case developed an infection or symptoms of illness at the time of reporting.

This case marks the 3rd human case and the first death related to avian influenza A(H3N8) ever reported worldwide. The previous 2 cases were reported from Henan and Hunan provinces in April and May 2022 respectively and recovered. The CFR for A(H3N8) is 33%; however, with only three human cases to date, the full spectrum of disease is highly uncertain.

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.

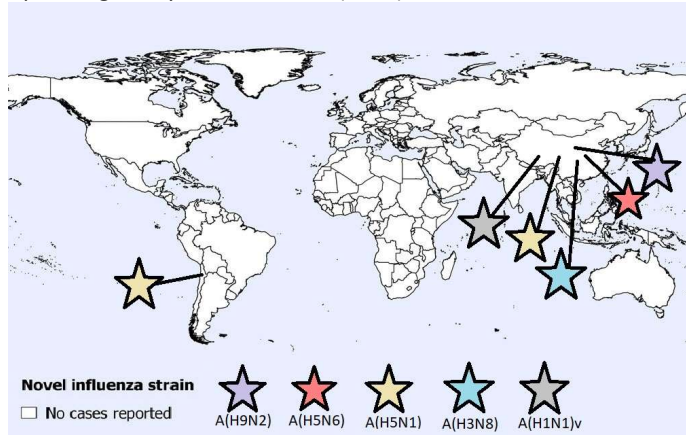
Globally, 446 A(H3N2)v cases have been reported since 2005, with <1% CFR. Five (5) A(H3N2)v cases were reported worldwide in 2022. Two (2) A(H3N2)v detections have been reported in Canadian residents since reporting began in 2005, with the latest case reported in June 2021.

SWINE ORIGIN INFLUENZA A(H1N1)v

Two (2) new human cases of swine origin influenza A(H1N1)v were reported in March 2023 from China. Other case details are unknown.

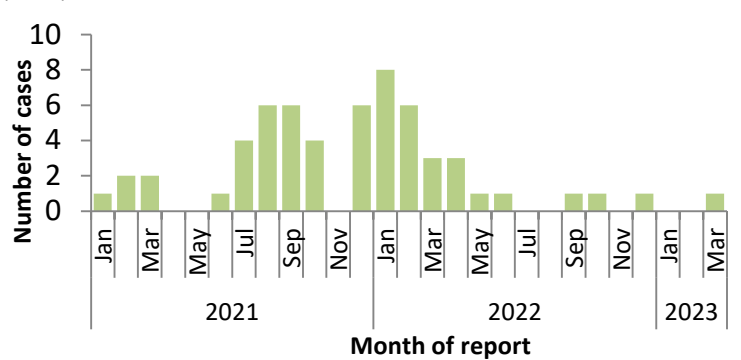
Globally, 44 human cases of A(H1N1)v have been reported since 2005, with no associated fatalities. Three (3) A(H1N1)v cases have been reported worldwide in 2023. Two (2) A(H1N1)v detections have been reported in Canadian residents since reporting began in 2005, with the latest case reported in April 2021.

Figure 1. Spatial distribution of human cases of avian and swine influenza reported globally in March 2023 (n=13).



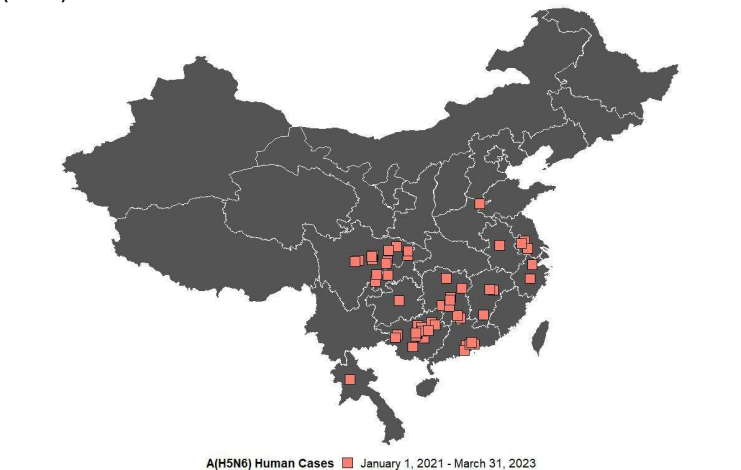
Note: Map was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the latest WHO Event Information Site (EIS) postings. This map reflects data available through these publications as of March 31, 2023.

Figure 2. Temporal distribution of human cases of A(H5N6) influenza reported globally, by month, January 1, 2021, to March 31, 2023 (n=58).



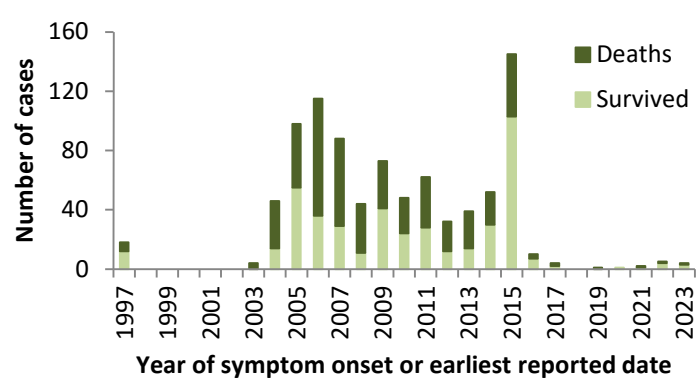
Note: Graph was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the WHO EIS postings and the Hong Kong Centre for Health Protection (CHP) press releases. This graph reflects data available as of March 31, 2023.

Figure 3. Spatial distribution of human cases of A(H5N6) influenza reported in China and Lao PDR from January 1, 2021, to March 31, 2023 (n=58).



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 March 31, 2023.

Figure 4. Temporal distribution of human cases of A(H5N1) influenza reported globally, by year, January 1, 1997, to March 31, 2023 (n=891).



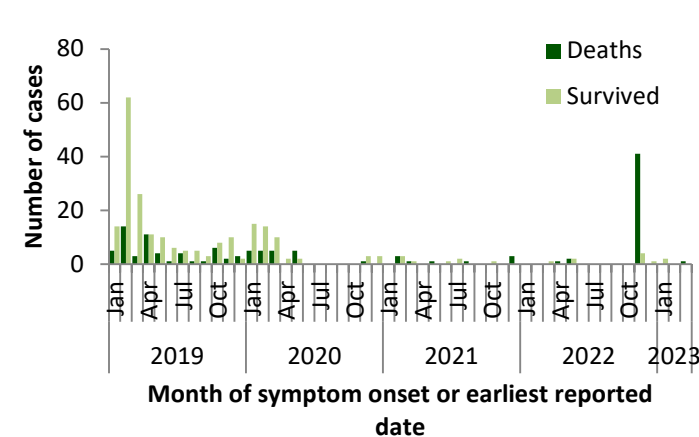
Note: Graph was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the WHO EIS postings, the US CDC's Health Alert Network (HAN), and WHO cumulative case counts. This graph reflects data available as of March 31, 2023.

MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV) UPDATE

In March 2023, one (1) new human case of MERS-CoV, a fatality, was reported in Saudi Arabia.

According to the WHO, 2,604 laboratory-confirmed cases of MERS-CoV, including 936 deaths, have been reported globally since reporting began in 2012 (CFR: 36%). Three (3) 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 March 31, 2023 (n=322).



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 March 31, 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.