



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 JANUARY 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 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)	[886 (463), 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)v 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(H3N2)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 neuraminidase results.

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

⁶A(H1NX)v: virus is a novel influenza A(H1) virus with pending 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.

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(H5NX)/A(H5N1)

One (1) new human case of avian influenza A(H5NX) was reported in January 2023 from Ecuador. The case is a 9-year-old female living in Bolívar, Ecuador. She was admitted to the intensive care unit (ICU) with septic shock of pulmonary and meningeal focus. As of the time of last report, the case remains in the ICU in stable condition. Prior to illness onset, the case and her family were exposed to backyard poultry, which died without apparent cause. Genetic sequencing results are pending. This event occurred in the context of an ongoing outbreak of avian influenza A(H5N1) in birds in the province of Bolívar in Ecuador.

There have been 886 human cases of A(H5N1) reported globally since 1997, with a CFR of 52% (Figure 4). Five (5) human infections with A(H5N1) and two (2) cases of A(H5NX) have been reported worldwide since 2022, all linked to the highly pathogenic avian influenza (HPAI) outbreak in domestic poultry, wild birds, and some mammals that continues to evolve in Europe and the Americas.

The four (4) human cases from the United Kingdom (1), the United States (1), and Spain (2) were mild/asymptomatic and the three (3) human cases from Vietnam (1), China (1), and Ecuador (1) were fatal/severe. All six (6) previously reported cases have been linked to clade 2.3.4.4b. The clade of the virus for the 7th case detected in Ecuador remains to be confirmed. The recent detections provide additional information regarding the spectrum of disease caused by A(H5N1) viruses belonging to the clade 2.3.4.4b such that severe and fatal outcomes can be expected. According to the WHO, the risk of infection for humans remains low and no sustained human-to-human transmission has been reported.

No domestically acquired A(H5N1) infections have ever been reported in Canada, although a significant number of A(H5N1) detections associated with the current 2021-2023 epizootic have been reported in domestic, backyard, wild bird populations, and other wild animal species across Canada. In 2014, Canada (Alberta) reported one single fatal case of A(H5N1) in a resident returning from travel in China.

SWINE INFLUENZA UPDATES

SWINE ORIGIN INFLUENZA A(H1N2)v

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

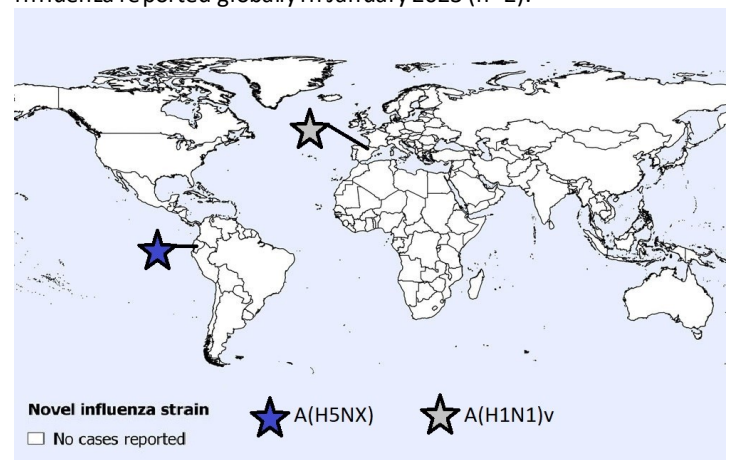
Globally, 446 A(H3N2)v cases have been reported since 2005, with <1% CFR. Five (5) A(H3N2)v cases were reported worldwide in 2022. Two (2) A(H3N2)v detections have been reported in Canadian residents since reporting began in 2005, with the latest case reported in June 2021.

SWINE ORIGIN INFLUENZA A(H1N1)v

One (1) new human case of swine origin influenza A(H1N1)v was reported in January 2023 from Spain. The case was a 63-year-old male from Navarra, Spain, with a history of immunodepression. The case was admitted to the hospital with pneumonia and later recovered. Prior to illness onset, the case visited an indoor swine farm for non-occupational reasons. During this visit, the case had no direct contact with pigs and did not wear personal protective equipment (PPE). As of the time of last report, no secondary cases have been detected.

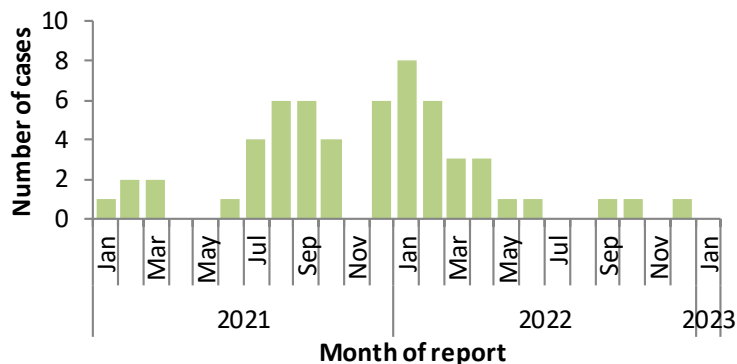
Globally, 42 human cases of A(H1N1)v have been reported since 2005, with no associated fatalities. In 2022, four (4) A(H1N1)v cases were reported worldwide. So far, one (1) A(H1N1)v case has been reported worldwide in 2023. Two (2) A(H1N1)v detections have been reported in Canadian residents since reporting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



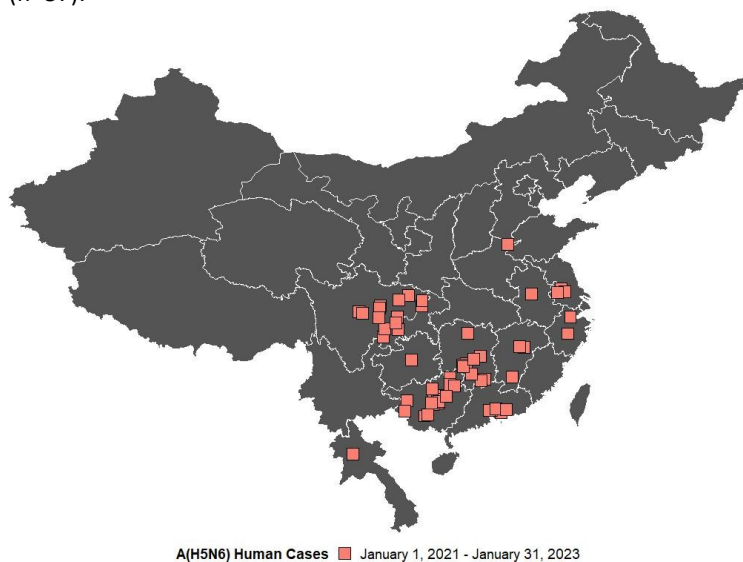
Note: Map was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the latest WHO Event Information Site (EIS) postings. This map reflects data available through these publications as of January 31, 2023.

Figure 2. Temporal distribution of human cases of A(H5N6) influenza reported globally, by month, January 1, 2021 to January 31, 2023 (n=57).



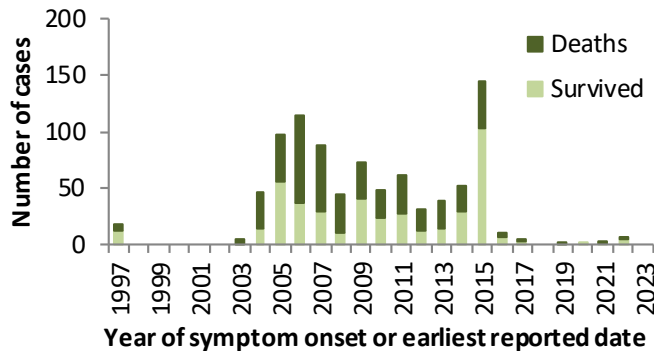
Note: Graph was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the WHO EIS postings and the Hong Kong Centre for Health Protection (CHP) press releases. This graph reflects data available as of January 31, 2023.

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

Figure 4. Temporal distribution of human cases of A(H5N1) influenza reported globally, by year, January 1, 1997 to January 31, 2023 (n=886).



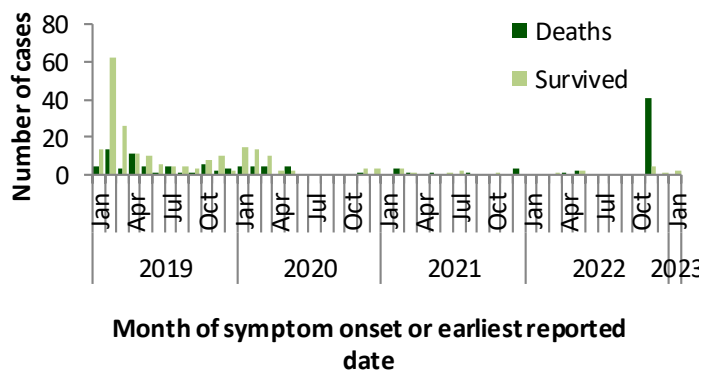
Note: Graph was prepared by the Centre for Immunization and Respiratory Infectious Diseases (CIRID) using data from the WHO EIS postings, the US CDC's Health Alert Network (HAN), and WHO cumulative case counts. This graph reflects data available as of January 31, 2023.

MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV) UPDATE

Two (2) new human cases of MERS-CoV were reported in January 2023 from two (2) different countries: one (1) from Saudi Arabia and one (1) from Oman. No case details were provided for the case from Saudi Arabia. The case from Oman was a 60-year-old male who had a history of ischemic heart disease. He was hospitalized, received non-invasive ventilation, and later recovered from the infection. The case reported no direct contact with camels or camel products prior to illness onset; however, camel racing exercises occurred in the same residential area as the case.

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%). So far, two (2) MERS-CoV cases have been reported globally in 2023. Seven (7) MERS-CoV cases were reported worldwide to the WHO in 2022. 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 January 31, 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 January 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.