SURVEILLANCE REPORT

Zoonotic influenza

Annual Epidemiological Report for 2023

Key facts

- Sporadic human infections with avian influenza virus subtypes A(H3N8), A(H5N1), A(H5N6), A(H9N2), A(H10N5) were reported globally by four countries for 2023.
- Human infections with influenza A(H1N1) variant (v), A(H1N2)v and A(H3Nx)v viruses of swine origin were reported by eight countries globally for 2023.
- No human cases of infection with avian influenza viruses were reported in the EU/EEA in 2023. Human infections with influenza variant virus of swine origin have sporadically been reported in EU/EEA, including influenza A(H1N1)v virus in the Netherlands and Spain in 2023.
- Considering the widespread transmission of zoonotic influenza viruses in animal populations, reported transmission to humans with zoonotic influenza viruses remains infrequent.

Introduction

Animal influenza viruses that usually circulate in animal species can, in rare occasions, transmit to humans and cause zoonotic influenza virus infections. In Europe, there has been widespread transmission of highly pathogenic avian influenza (HPAI) A(H5N1) in wild birds since 2020, causing outbreaks in poultry establishments. Since late 2022, HPAI A(H5N1) has also been detected more frequently in mammals such as wild carnivores, marine mammals, fur farm animals, and pets [1]. Most human infections with zoonotic influenza viruses are caused by avian influenza viruses that circulate in wild birds and spill over to farmed poultry or swine influenza viruses that are present in pig populations. Infections are typically related to direct contact with infected animals or contaminated environments. Infections can result in asymptomatic, mild or severe disease, causing symptoms which range from fever, conjunctivitis and cough to severe pneumonia, but can also cause less frequently reported symptoms such as gastroenteritis or neurological symptoms.

Methods

Data on human infections with zoonotic influenza virus reported globally were systematically collected from official, public sources identified through ECDC's epidemic intelligence activities and compiled in a line list, as described in [2]. This report includes events and data from 2023, retrieved from the ECDC line list in February 2025. The date of identification or onset of symptoms was used, and if not available, the date of sampling or reporting.

Since September 2017, ECDC, together with the European Food Safety Authority (EFSA) and the European Union Reference Laboratory for Avian Influenza (EURL), have been publishing quarterly updates on the avian influenza situation in the EU/EEA and globally (see link). The avian influenza detections in humans for 2023 listed in the subsequent sections have been described in the avian influenza situation reports [3-8].

Suggested citation: European Centre for Disease Prevention and Control. Zoonotic influenza. In: ECDC. Annual epidemiological report for 2023. Stockholm: ECDC; 2025.

Stockholm, November 2025

Epidemiology

Avian influenza in humans

A total of 29 human cases or detections of avian influenza virus were reported by four countries globally with onset of symptoms or identification in 2023, including subtypes A(H3N8), A(H5N1), A(H5N6), A(H9N2), and A(H10N5). The majority of cases were reported by China (18 cases), followed by Cambodia (6 cases), United Kingdom (3 detections, 1 inconclusive) and Chile (1 case). Out of those cases for which information on hospitalisation (n=27) was provided, 16 (59%) of the cases were hospitalised, and 8 (28%) out of the total 29 cases had a fatal outcome. All but one of the reported human cases had a history of known exposure to poultry or a contaminated environment. Reported human cases and detections of avian influenza virus in 2023 are illustrated in Figure 1 by subtype. A decrease in reported cases of avian influenza in humans was observed in 2023 compared to 2021 and 2022 (Figure 2), particularly for subtypes A(H5N6) and A(H9N2).

Figure 1. Reported cases and detections of avian influenza virus in humans with onset or identification in 2023 by country and subtype

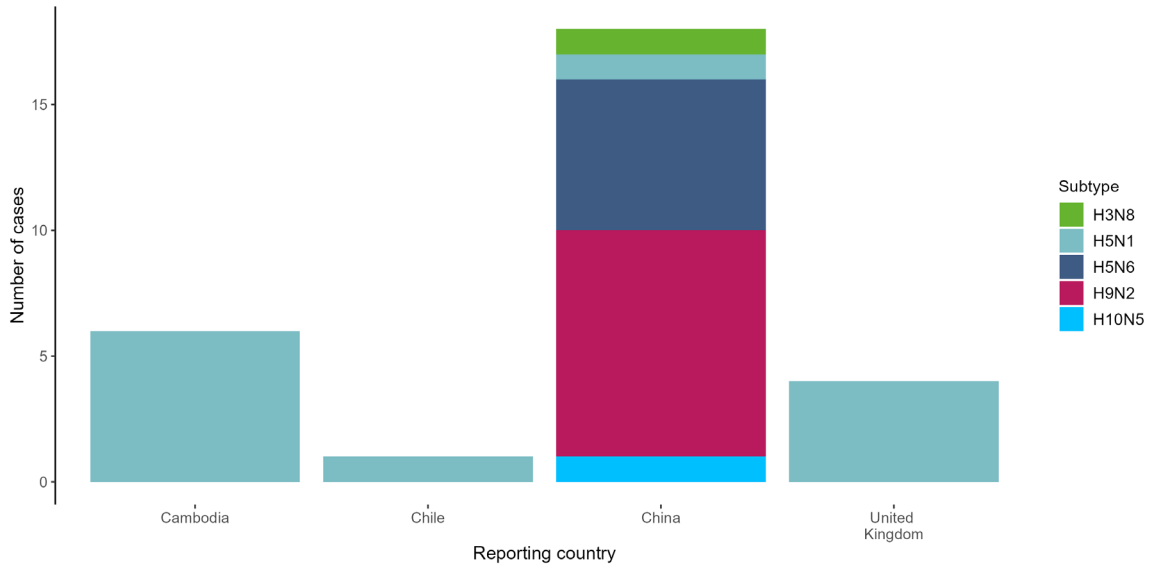
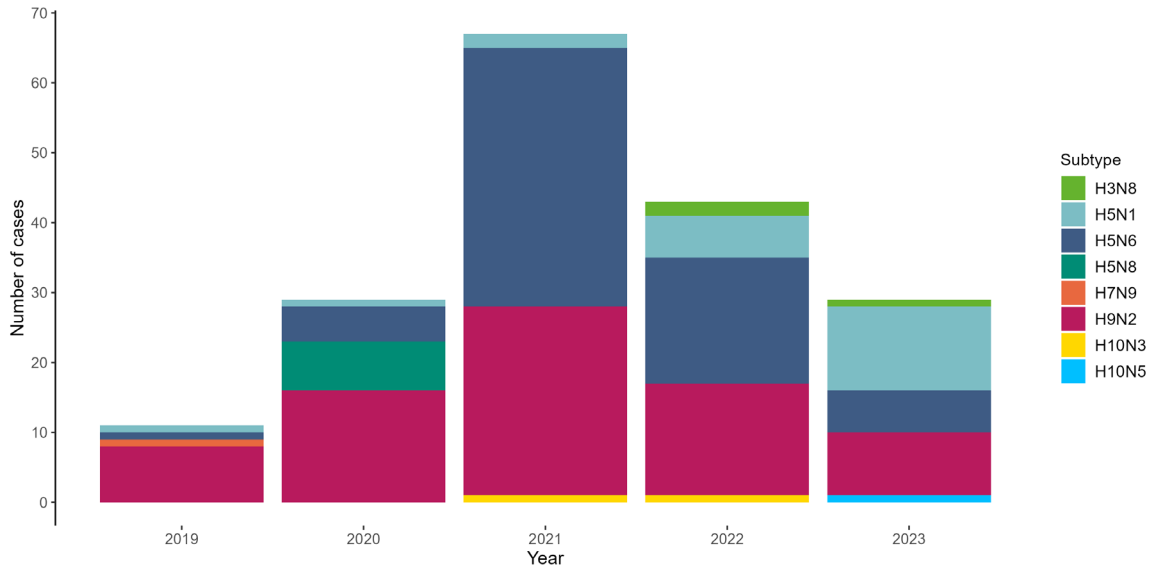


Figure 2. Reported human cases and detections of avian influenza virus by subtype between 2019 and 2023



Avian influenza A(H3N8) virus

China reported one fatal case of avian influenza virus A(H3N8) infection in a 56-year-old woman with underlying conditions in 2023. The patient had exposure to poultry at live poultry markets, the neighbour kept poultry, and there were wild birds in the adjacency of her home. In total, there have been three cases of avian influenza A(H3N8) reported in humans globally, and this was the first known death after infection [4,5,9].

Avian influenza A(H5N1) virus

In 2023, there were 12 cases or detections of avian influenza A(H5N1) virus in humans reported globally.

In Europe, United Kingdom reported four detections of avian influenza A(H5N1) in workers involved in culling operations at three farms affected by outbreaks of highly pathogenic avian influenza A(H5N1) virus in poultry. Three of the detections were in asymptomatic individuals while the fourth person experienced mild clinical symptoms. Three of the detections were considered likely contaminations, while the investigation was inconclusive for the fourth detection and may have been consistent with infection or contamination of the respiratory tract [5,6,10].

Cambodia reported six cases of avian influenza A(H5N1) virus infection in three children and three adults in 2023, which were the first human A(H5N1) cases reported by Cambodia since 2014. For those which information was available (n=5), all were hospitalised, and four out of six were fatal. All cases had exposure to sick or dead poultry before onset of symptoms or detection of infection. Two of the cases were in a family cluster involving an 11-year-old girl and her 49-year-old father. For both cases, symptom onset occurred on the same day and both had previous exposure to sick poultry. Human-to-human transmission was ruled out by the local authorities [7,11]. There was one case of A(H5N1) reported in China in a 53-year-old woman, who developed severe symptoms following exposure to poultry. The case was hospitalised but subsequently recovered [11].

In the Americas, Chile reported one case of avian influenza A(H5N1) in a 53-year-old male in 2023, which was the first case reported by the country. The patient was hospitalised following development of worsening, respiratory symptoms, but recovered following treatment. There were many dead sea mammals and wild birds in the adjacency of the patient's home and the case was thought to have been infected through environmental exposure [12].

Avian influenza A(H5N6) virus

China reported six human cases of avian influenza virus A(H5N6) with onset or detection in 2023 in adults aged between 27 and 68 years. All six cases were hospitalised and two of the cases were fatal. All had a known history of exposure to poultry (ECDC line list).

Avian influenza A(H9N2) virus

In total, 9 human cases of avian influenza A(H9N2) were reported by China with onset or identification in 2023. Six of the cases were in children aged 6 years or below, and three of the cases were in adults. Two of the 9 cases required hospitalisation, and all cases recovered from the infection. All had a history of exposure to poultry (ECDC line list).

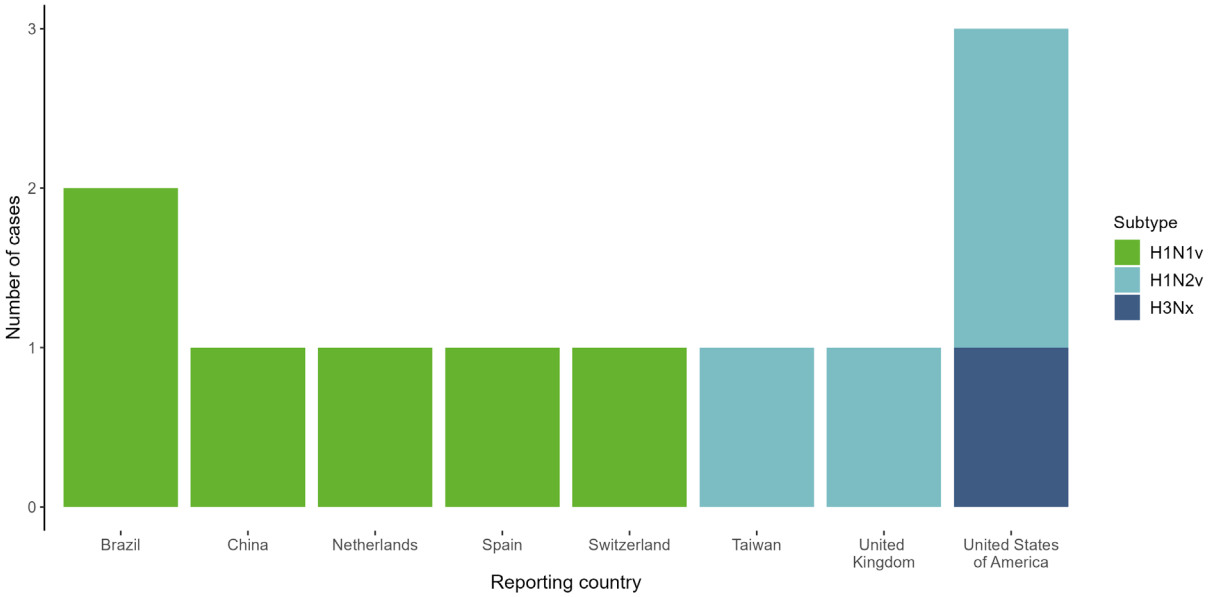
Avian influenza A(H10N5) virus

In 2023, one fatal case of avian influenza A(H10N5) was reported in China in a 63-year-old woman with multiple underlying conditions, who was also co-infected with seasonal influenza A(H3N2) virus. The patient had contact with live duck which she later consumed. Remaining duck meat tested positive for avian influenza A(H10N5) virus. The case was the first documented human infection with avian influenza A(H10N5) virus [8,13].

Swine influenza in humans

A total of 11 human cases of influenza variant (v) viruses of swine origin were reported by 8 countries globally with onset of symptoms or identification in 2023, including subtypes A(H1N1)v, A(H1N2)v and A(H3Nx)v. Three of the cases were reported by the United States, two in Brazil, and China, Taiwan, the Netherlands, Spain, Switzerland and the United Kingdom all reported one case each (Figure 3).

Figure 3. Reported human cases of infection with influenza A variant viruses of swine origin with onset or detection in 2023 by country and subtype



Swine influenza A(H1N1)v virus

Six human cases of infection with swine influenza A(H1N1)v virus were reported globally with onset or detection in 2023. The cases were mostly mild, apart from two of the cases that were hospitalised, including one fatal case in an individual with underlying conditions. Five of the cases were adults and one was below 5 years of age. Two of the cases were reported by Brazil, while China, the Netherlands, Spain, and Switzerland reported one case each. Out of the five cases for which information on exposure was available, two worked at a pig farm while three did not have any known direct exposure to pigs (ECDC line list).

Swine influenza A(H1N2)v virus

In 2023, four cases of human infection with swine influenza A(H1N2)v virus were reported by three countries: United States (2 cases), Taiwan (1 case), and United Kingdom (1 case). Three of the cases were in individuals below 18 years of age, and one case was in an individual above 75 years of age. All the cases were mild and recovered from the infection. Three of the cases had known exposure to pigs. The remaining case was detected as a part of routine national surveillance for influenza and had no known direct contact with pigs. Nevertheless, there were pig farms in the nearby area of the case's residence [14](ECDC Line list).

Swine influenza A(H3Nx) virus

In 2023, there was one reported case of human infection with swine influenza A(H3Nx) virus by the United States. The case was an 11-year-old female who experienced mild respiratory disease and recovered from the infection. The case had exposure to pigs infected with influenza A at an agricultural fair before onset of symptoms [15]

Discussion

In 2023, sporadic cases of infection with avian influenza viruses were reported in humans globally, most of which had had a history of direct contact with infected poultry or exposure to a contaminated environment. However, no sustained human-to-human transmission has been observed. In Europe, despite a high number of detections and outbreaks of highly pathogenic influenza A(H5N1) reported in wild and domestic birds in 2023 [4-8,11], there have been no confirmed infections with avian influenza A(H5N1) in humans documented in the EU/EEA to date.

Human infections with influenza viruses of swine origin were detected in the EU/EEA, with cases of A(H1N1)v reported in the Netherlands and Spain. Human infections with influenza viruses of swine origin were also reported from non-EU/EEA countries Brazil, China, Switzerland, Taiwan, the United Kingdom and the United States due to subtypes A(H1N1)v, A(H1N2)v and A(H3Nx)v. Apart from two hospitalised cases, including one fatal, the infections were mostly reported to have caused mild respiratory illness.

Considering the extensive circulation of zoonotic influenza viruses in animal populations, with frequent human exposures in recent years, reported human infection with zoonotic influenza viruses remains rare. However, sporadic infections with zoonotic influenza viruses in humans are likely to continue occurring in areas where zoonotic influenza viruses are prevalent and individuals have unprotected exposure to infected animals or their environment. Influenza viruses in animals also continue to reassort and evolve genetically. This underlines the need to continuously monitor the current situation and identify changes that could contribute to adaptation to mammals, including humans.

Human infections with influenza viruses of animal origin are observed sporadically in the EU/EEA and need to be tackled through an integrated One Health approach. Timely sharing of information on outbreaks in animals as well as virus characteristics are key for situation assessments and implementation of prevention and control measures. Transmission events of zoonotic influenza viruses to humans should be identified and reported as early as possible to investigate any human-to-human spread and facilitate implementation of necessary mitigation measures [2,16].

References

1. European Food Safety Authority (EFSA), Abrahantes JC, Aznar I, Catalin I, Kohnle L, Mulligan KF, et al. Avian influenza annual report 2023. EFSA Journal. 2025;23(1):e9197. Available at: https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2025.9197
2. European Food Safety Authority (EFSA) Panel on Animal Health and Animal Welfare (AHAW), European Centre for Disease Prevention and Control (ECDC), Alvarez J, Boklund AE, Dippel S, Dórea F, et al. Preparedness, prevention and control related to zoonotic avian influenza. EFSA Journal. 2025;23:10.2903/j.efsa.025.9191a.
3. European Food Safety Authority (EFSA), European Centre for Disease Prevention Control (ECDC), European Union Reference Laboratory (EURL) for Avian Influenza, Adlhoch C, Fusaro A, Gonzales JL, et al. Avian influenza overview December 2022–March 2023. EFSA Journal. 2023;21(3):e07917. Available at: https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2023.7917
4. European Food Safety Authority (EFSA), European Centre for Disease Prevention Control (ECDC), European Union Reference Laboratory (EURL) for Avian Influenza, Adlhoch C, Fusaro A, Gonzales JL, et al. Avian influenza overview March–April 2023. EFSA Journal. 2023;21(6):e08039. Available at: https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2023.8039
5. European Food Safety Authority (EFSA), European Centre for Disease Prevention Control (ECDC), European Union Reference Laboratory (EURL) for Avian Influenza, Adlhoch C, Fusaro A, Gonzales JL, et al. Avian influenza overview April–June 2023. EFSA Journal. 2023;21(7):e08191. Available at: https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2023.8191
6. European Food Safety Authority (EFSA), European Centre for Disease Prevention Control (ECDC), European Union Reference Laboratory for Avian Influenza, Adlhoch C, Fusaro A, Gonzales JL, et al. Avian influenza overview June–September 2023. EFSA Journal. 2023;21(10):e08328. Available at: https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2023.8328
7. European Food Safety Authority (EFSA), European Centre for Disease Prevention Control (ECDC), European Union Reference Laboratory (EURL) for Avian Influenza, Adlhoch C, Fusaro A, Gonzales JL, et al. Avian influenza overview September–December 2023. EFSA Journal. 2023;21(12):e8539. Available at: https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2023.8539
8. European Food Safety Authority (EFSA), European Centre for Disease Prevention and Control (ECDC), European Union Reference Laboratory (EURL) for Avian Influenza Fusaro A, Gonzales JL, Kuiken T, et al. Avian influenza overview December 2023–March 2024. Efsa j. 2024 Mar;22:e8754. Available at: https://efsa.onlinelibrary.wiley.com/doi/pdfdirect/10.2903/j.efsa.2024.8754?download=true
9. Zhuang Y, Wang M, Liang L, Mao Y, Wang K, Yang S, et al. First Known Human Death After Infection With the Avian Influenza A/H3N8 Virus: Guangdong Province, China, March 2023. Clin Infect Dis. 2024 Mar 20;78(3):646-50.
10. UK Health Security Agency (UKHSA). Investigation into the risk to human health of avian influenza (influenza A H5N1) in England: technical briefing 5. London: UKHSA; 2023. Available at: https://www.gov.uk/government/publications/avian-influenza-influenza-a-h5n1-technical-briefings/investigation-into-the-risk-to-human-health-of-avian-influenza-influenza-a-h5n1-in-england-technical-briefing-5
11. European Food Safety Authority (EFSA), European Centre for Disease Prevention and Control (ECDC), European Union Reference Laboratory (EURL) for Avian Influenza, Adlhoch C, Fusaro A, Gonzales JL, Kuiken T, et al. Avian influenza overview December 2022–March 2023. EFSA Journal. 2023 Mar;21(3):e07917.
12. World Health Organization (WHO). Human Infection caused by Avian Influenza A (H5N1) – Chile. Available at: https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON461
13. World Health Organization (WHO). Influenza at the human-animal interface Summary and risk assessment, from 22 December 2023 to 26 February 2024. Geneva: WHO; 2024. Available at: https://cdn.who.int/media/docs/default-source/influenza/human-animal-interface-risk-assessments/influenza_summary_ira_ha_interface_feb_2024.pdf
14. World Health Organization (WHO). Influenza at the human-animal interface Summary and risk assessment, from 2 November to 21 December 2023. Geneva: WHO; 2023. Available at: https://cdn.who.int/media/docs/default-source/influenza/human-animal-interface-risk-assessments/to-influenza-at-the-human-animal-interface-summary-and-assessment--from-2-november-to--21-december-2023.pdf
15. World Health Organization (WHO). Influenza at the human-animal interface Summary and risk assessment, from 15 July to 30 Aug 2023. Geneva: WHO; 2023. Available at: https://cdn.who.int/media/docs/default-source/influenza/human-animal-interface-risk-assessments/influenza-at-the-human-animal-interface-summary-and-assessment--from-15-july-to-30-august-2023.pdf
16. European Centre for Disease Prevention and Control (ECDC), European Food Safety Authority (EFSA), Hallmaier-Wacker L, Enkirch T, Melidou A, Willgert K, et al. Coordinated One Health investigation and management of outbreaks in humans and animals caused by zoonotic avian influenza viruses. EFSA Journal. 2025;23(1):e9183. Available at: https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2025.9183