SURVEILLANCE REPORT

Zoonotic influenza

Annual Epidemiological Report for 2021

Key facts

- No human infections with avian influenza virus were reported in the European Union/European Economic Area (EU/EEA) in 2021.
- Sporadic human infections with avian influenza virus A(H5) (including A(H5N1) and A(H5N6)), A(H9N2) and A(H10N3) infection were reported globally in 2021.
- Outbreaks and detections of highly pathogenic avian influenza viruses, mainly A(H5N1) and A(H5N8), affected poultry, wild and captive birds worldwide in 2021.
- The year also marked the onset of the largest epidemic of avian influenza viruses in birds observed in the EU/EEA to date.
- In 2021, human infections with influenza virus A(H1N1)v and A(H1N2)v of swine origin were detected in four EU/EEA countries: Austria, Denmark, France, and Germany.
- Outside of the EU/EEA influenza virus A(H1Nx)v, A(H1N1)v, A(H1N2)v, and A(H3N2)v of swine origin caused sporadic human infections in Australia, Canada, China, Taiwan, and the United States.

Methods

This report is based on data for 2021, retrieved on 15 November 2022 from different sources, such as the World Health Organization, the World Organisation for Animal Health, the European Food Safety Authority (EFSA), and ECDC's epidemic intelligence activities.

This report includes 2021 events and data and does not cover the entire winter-season pattern.

Since September 2017, ECDC, together with EFSA and the EU reference laboratory for avian influenza, have been publishing quarterly updates on the avian influenza situation (see link) [1]. All avian influenza detections in humans and birds for 2021 listed below have been published in the avian influenza situation reports [2-6].

Erratum: Errors in the listed countries reporting detection in the 'Avian influenza detections in birds' section were corrected on 3 April 2023.

Suggested citation: European Centre for Disease Prevention and Control. Chlamydia infection. In: ECDC. Annual epidemiological report for 2021. Stockholm: ECDC; 2023.

Stockholm, March 2023

Epidemiology

Avian influenza in humans

Avian influenza virus A(H5)

Three detections of influenza A(H5) were reported from asymptomatic people involved in culling activities Nigeria [7].

Avian influenza virus A(H5N1)

One fatal case of an infected 18-year-old male with avian influenza A(H5N1) was reported from India and one detection in a 79-year-old male exposed to infected birds was reported from the United Kingdom (UK) [4,6,8-10].

Avian influenza virus A(H5N6)

China reported 36 people infected with influenza A(H5N6), 11 of them deceased, and Laos reported one human infection [3-8,11-15]. Exposure to infected birds or the environment before onset of symptoms were reported for these people.

Avian influenza virus A(H9N2)

In 2021, 26 infections with avian influenza A(H9N2) virus were reported by China and one by Cambodia [2-7,11-17]. The infections mostly affected children following exposure to infected poultry.

Avian influenza virus A(H10N3)

China reported one infection with avian influenza A(H10N3), in a 41-year-old male [12].

Swine influenza in humans

Swine influenza virus A(H1Nx)v

One human infection with swine influenza A(H1Nx)v was reported from the United States (US) [14].

Swine influenza virus A(H1N1)v

In 2021, 16 human infections with swine influenza virus A(H1N1)v were reported globally, including three human infections in two EU/EEA countries: Denmark (2) and Germany (1) [7,11,15]. Canada (1), China (5), and the US (7) also reported zoonotic transmissions to humans [7,11,13-16].

Swine influenza virus A(H1N2)v

Two human infections with swine influenza A(H1N2)v were reported from two EU/EEA countries: Austria (1) and France (1) [13]. Human infections were also reported from Canada (2), Taiwan (1), and the US (5) [12-17].

Swine influenza virus A(H3N2)v

Human infections with swine influenza A(H3N2)v were reported from Australia (1), Canada (1) and the US (3) [7,11-14].

Avian influenza detections in birds

Highly pathogenic avian influenza A(H5)

Highly pathogenic avian influenza A(H5) viruses without N-type determination have been reported from Europe (Austria, Belgium, Bulgaria, Czechia, Denmark, the Netherlands, Norway, Romania, Russia, Sweden, and Ukraine), Africa (Benin, Ghana, Lesotho, and South Africa), and Asia (Kazakhstan, Laos, and Pakistan) [2-6,18].

Highly pathogenic avian influenza A(H5N1)

Highly pathogenic avian influenza A(H5N1) virus continued to cause outbreaks and was detected and affected poultry and wild birds in several countries in Europe (Austria, Belgium, Bosnia and Herzegovina, Croatia, Czechia, Denmark, Estonia, Faroe Islands, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the UK), Africa (Benin, Botswana, Burkina Faso, Cote D'Ivoire, Mali, Mauritania, Niger, Nigeria, Senegal, South Africa, and Togo), Americas (Canada, and the US) and Asia (Cambodia, China, Hong Kong, India, Israel, Japan, the Republic of Korea, Taiwan, and Vietnam) [2-6,18].

Highly pathogenic avian influenza A(H5N2)

Avian influenza A(H5N2) viruses were detected in Europe (Serbia), Africa (Nigeria), and Asia (Taiwan) [3,5,6,18].

Highly pathogenic avian influenza A(H5N3)

In 2021, detections of avian influenza A(H5N3) virus were reported from Europe (Denmark, France, Germany, Ireland, the Netherlands, and the UK) [2,3,18].

Highly pathogenic avian influenza A(H5N4)

Avian influenza A(H5N4) viruses were detected in Europe (Germany, the Netherlands, Sweden, and Switzerland) [2,3,18].

Highly pathogenic avian influenza A(H5N5)

Avian influenza A(H5N5) viruses were detected in Europe (Austria, Belgium, Czechia, Denmark, Germany, Hungary, Poland, Romania, Russia, Slovakia, Sweden, and Switzerland) and Asia (Iran and Taiwan) [2-6,18].

Highly pathogenic avian influenza A(H5N6)

In 2021, outbreaks related to highly pathogenic avian influenza A(H5N6) viruses were reported from Asia (China, and Vietnam) [2,3,18].

Highly pathogenic avian influenza A(H5N8)

In 2021, large outbreaks in wild birds and poultry were mainly reported from Europe (Albania, Austria, Belgium, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Norway, Poland, Romania, Russia, Serbia, Slovakia, Spain, Sweden, the UK, and Ukraine), but also Africa (Algeria), and Asia (Afghanistan, China, Hong Kong, India, Iran, Iraq, Israel, Japan, Kuwait, Nepal, Pakistan, the Republic of Korea, and Vietnam) [2,3,5,6,18].

Low pathogenic avian influenza viruses of subtype A(H5Nx)

Low pathogenic avian influenza A(H5) viruses without N-typing have been reported from Africa (South Africa), America (the US), and Asia (Japan) [2,3,18]. Low pathogenic A(H5N2) findings were reported from South Africa and A(H5N3) from France.

Highly and low pathogenic avian influenza viruses of subtype A(H7Nx)

Low pathogenic avian influenza virus A(H7) has been reported in the US. Moreover, outbreaks of low pathogenic A(H7N7) have been reported in Italy. France and Lithuania reported detections of high pathogenic A(H7N7) viruses in wild birds. [2,3,18].

Discussion

The year 2021 marked the onset of the largest epidemic of avian influenza in Europe, with the highest number of outbreaks in poultry farms as well as wild and captured birds as well as a highly diversification of avian influenza viruses circulating in bird populations [6]. Despite these large outbreaks, no human cases were identified in the EU/EEA.

Human infections with avian influenza viruses were reported from countries outside the EU/EEA (Cambodia China, India, Laos, Nigeria, and the UK). Similarly, human infections with influenza viruses of swine origin were reported from non-EU/EEA countries, with several cases occurring in Australia, Canada, China, Taiwan, and the US. Human infections of swine influenza virus were also detected in the EU, with cases in Austria, Denmark, France, and Germany.

In 2021, extensive outbreaks of highly pathogenic avian influenza A(H5N1) and A(H5N8) viruses affected wild birds and poultry farms in EU/EEA countries as well as in non-EU/EEA countries.

Public health implications

Zoonotic transmission of influenza viruses of animal origin remains a rare event, but viruses in animals continue to evolve genetically and reassort, which underlines the need to continuously monitor and identify changes that could contribute to improved transmission and adaptation to mammals, including humans.

Zoonotic infections in humans are observed sporadically in the EU/EEA and remain a concern for human health that needs to be tackled in a One Health approach. Rapid sharing of information about outbreaks as well as viral sequence data are key to understanding and assessing the situation. Transmission events of influenza viruses of animal origin to humans should be identified as early as possible to investigate any human-to-human spread and implement control measures.

Candidate vaccine viruses for pandemic preparedness are developed, reviewed, and updated twice a year [19].

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