SURVEILLANCE REPORT

Zoonotic influenza

Annual Epidemiological Report for 2017

Key facts

- No human cases of avian influenza were reported in the EU/EEA. Sporadic cases were reported from Africa and Asia.
- Outbreaks and detections of highly pathogenic avian influenza viruses such as A(H5N1), A(H5N2), A(H5N3), A(H5N5), A(H5N6) or A(H5N8) continued to affect poultry, wild and captured birds worldwide.
- Influenza viruses A(H1N1)v, A(H1N2)v, and A(H3N2)v of swine origin caused human cases in Switzerland and the United States.

Methods

This report is based on data for 2017 retrieved from Epidemic Intelligence on 18 May 2018.

This report includes 2017 events and data and does not follow the entire winter season. For a detailed description of methods used to produce this report, refer to the *Methods* chapter.

Since September 2017, EFSA, ECDC and the EU reference laboratory for avian influenza have published quarterly updates of the situation on avian influenza [1].

Epidemiology

Avian and swine influenza in humans

Avian influenza virus A(H5N1)

In 2017, highly pathogenic avian influenza A(H5N1) virus caused continued outbreaks and was detected in poultry and wild birds [2]. Sporadic transmission to humans was observed in Egypt, with three reported cases, including one fatality, and in Indonesia, with one fatal case [2–6]. Transmission patterns were similar to previous years: cases were linked to close contact with infected poultry. Between 2003 and 2017, WHO reported 860 human cases of influenza A(H5N1), including 454 deaths [6].

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Avian influenza virus A(H5N6)

In 2017, China reported two human cases infected with avian influenza A(H5N6) virus, with the likely source of infection being exposure to infected poultry [2,7].

Avian influenza virus A(H7N4)

In December 2017, China reported the first human case infected with avian influenza A(H7N4) virus in a woman hospitalised with severe pneumonia. Before onset of disease, the patient had contact with live poultry in her backyard, which was also confirmed to be infected with A(H7N4) [2,8].

Avian influenza virus A(H7N9)

After the identification of a novel reassortant low pathogenic avian influenza virus A(H7N9) in China in March 2013, which has since mutated into a highly pathogenic form for poultry, 1 566 human cases, including 613 deaths, were reported from China, Hong Kong Special Administrative Region (SAR) and Taiwan, while Canada and Malaysia had previously reported travel-related cases [2,9]. In 2017, WHO reported 600 laboratory-confirmed human cases due to avian influenza A(H7N9) viruses, including at least 248 deaths (41%) [10]. The main sources of infection were exposure to infected poultry or contaminated environments. No sustained human-to-human transmission has been recorded, although clusters of human cases were identified [11].

Avian influenza virus A(H9N2)

In 2017, China reported six human cases due to avian influenza A(H9N2) virus. All six were exposed to poultry before onset of symptoms [2,4,5,8,12–14].

Swine influenza virus A(H1N1)v

Switzerland reported a mild human case infected with swine-derived influenza A(H1N1)v virus [9]. The case was a male farm worker exposed to pigs that were found to be infected with the same virus. The US also reported a case infected with A(H1N1)v having had contact with pigs prior to onset of symptoms [12].

Swine influenza virus A(H1N2)v

The US reported four human cases of swine-origin influenza A(H1N2)v [5,12,15].

Swine influenza virus A(H3N2)v

The US reported 62 human cases infected with swine-origin influenza A(H3N2)v viruses, five of whom were admitted to hospital [5,9,16].

Avian influenza detections in birds

Highly pathogenic avian influenza virus A(H5N1)

Highly pathogenic avian influenza A(H5N1) virus continued to circulate in 2017 and affected poultry and wild birds in several countries in Asia (Bangladesh, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal and Vietnam), Africa (Cameroon, Egypt, Niger, Nigeria and Togo) and the Middle East (Iran) [2,17–20].

France reported a highly pathogenic avian influenza A(H5N1) reassortant virus not related to A(H5N1) viruses circulating in Africa or south-east Asia and found no transmission to humans [2,17–20].

Highly pathogenic avian influenza virus A(H5N2)

In 2017, detections of influenza A(H5N2) virus were reported from China, Russia and Taiwan [2,17–20].

Highly pathogenic avian influenza virus A(H5N3)

In 2017, one detection of influenza A(H5N3) virus was reported from China [2,17–20].

Highly pathogenic avian influenza virus A(H5N5)

During the influenza A(H5N8) outbreaks in Europe, reassortant influenza A(H5N5) viruses were detected in Croatia, the Czech Republic, Germany, Greece, the Netherlands, Poland, Serbia and Slovenia [2,17–20].

Highly pathogenic avian influenza virus A(H5N6)

In 2017, continued circulation of highly pathogenic avian influenza A(H5N6) viruses and related outbreaks were reported from China, Hong Kong SAR, Japan, the Philippines, South Korea, Taiwan and Vietnam [2,17–20].

During influenza A(H5N8) outbreaks in Europe, reassortant influenza A(H5N6) viruses were detected in Germany, Greece, the Netherlands and Switzerland [2,17–20]. These new reassortant viruses are only distantly related to A(H5N6) viruses circulating in Asia and no transmission to humans has been reported for the former.

Highly pathogenic avian influenza virus A(H5N8)

In 2017, the large outbreaks affecting poultry, captured and wild birds in 2016 continued and were reported from different continents [2,17–20]. In the EU/EEA, 25 countries reported outbreaks: Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Cyprus, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom [27]. Other countries in the WHO European Region were also affected: Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Kazakhstan, Russia, Serbia, Switzerland and Ukraine reported detections.

Previously affected and new countries in Asia reported outbreaks, including China, India, Nepal, South Korea and Taiwan. Other affected countries were in the Middle East (Iran, Iraq, Israel and Saudi Arabia) and Africa (Cameroon, the Democratic Republic of the Congo, Egypt, Niger, Nigeria, South Africa, Uganda and Zimbabwe).

In addition to farmed poultry, influenza A(H5N8) virus was detected in migratory wild bird populations and domestic locally resident bird species. There has been no reported transmission to humans, but transmission to dogs has been reported from natural infections and under laboratory conditions [29,30].

ECDC published an updated rapid risk assessment related to the introduction of A(H5N8) into Europe and determined the risk for the general population as very low [21].

Low and highly pathogenic avian influenza virus A(H7N9)

In 2017, China reported continuous outbreaks due to low and highly pathogenic influenza A(H7N9) viruses [2,17–20]. Low and highly pathogenic A(H7N9) virus outbreaks were also reported from the US, but these viruses were not related to the viruses circulating in poultry in China that have caused severe infections in humans [22].

Low pathogenic avian influenza viruses of subtype A(H5)

France and South Korea reported detections of low pathogenic A(H5N1) viruses. The Dominican Republic, France, Germany, the Netherlands, South Africa, South Korea, Taiwan and the US reported low pathogenic A(H5N2) virus detections. A(H5N3) findings were reported from France, Japan, Germany and South Korea. Taiwan notified outbreaks due to A(H5N6) and France reported A(H5N9) virus detections [19,20].

High and low pathogenic avian influenza viruses of subtype A(H7)

In 2017, Mexico reported persistent outbreaks of highly pathogenic avian influenza A(H7N3) virus. Cambodia reported outbreaks of low pathogenic avian influenza A(H7N3) virus. Other low pathogenic avian influenza viruses of the H7 subtype were reported from China [A(H7N4)], Chile [A(H7N6)] and South Korea [A(H7N7)] [19,20].

Discussion

Despite various outbreaks of highly pathogenic avian influenza virus in wild birds and poultry holdings in EU/EEA countries in 2017, no human cases of avian influenza were reported in EU/EEA countries. However, human cases of avian influenza A(H5N1), A(H5N6), A(H7N4), A(H7N9), and A(H9N2) were reported from countries outside the EU/EEA.

Human infections with influenza viruses of swine origin were reported from countries outside the EU/EEA, with several cases occurring in the US and one in Switzerland. Viruses of animal origin continue to evolve genetically and reassort with influenza viruses better adapted to and transmissible among humans. Such emerging new avian influenza viruses have the potential to infect humans and cause severe disease.

Since September 2017, EFSA, ECDC and the EU reference laboratory for avian influenza have published quarterly updates of the situation on avian influenza [1].

Public health implications

Zoonotic influenza viruses remain a concern for human health in Europe, so rigorous surveillance among animals is needed. Reassortment events between swine, avian and human viruses should be monitored carefully and any transmission to humans should be identified as early as possible to prevent further human-to-human spread. Influenza A(H7N9) is the zoonotic influenza virus with the highest potential for emergence of a pandemic and the highest impact [23]. To better prepare for a new pandemic possibly arising from any of the zoonotic strains, WHO has published a list of candidate vaccines [24]. An overview of national public health measures in EU/EEA countries related to avian influenza virus A(H5N8) was recently published [25].

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