

Zoonotic influenza

Reporting on 2014 data retrieved from TESSy*

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Key facts

- Large human outbreaks of avian influenza A(H5N1) and A(H7N9) were reported from China and Egypt.
- Sporadic human cases of avian influenza A(H5N6), A(H9N2) and A(H10N8) were reported world-wide.
- No human cases of avian influenza were reported in the EU/EEA.
- In 2014, an increasing number of outbreaks and detections in poultry and wild birds of highly pathogenic avian influenza viruses such as A(H5N2), A(H5N3) or A(H5N8) were reported worldwide.
- Influenza viruses A(H1N1)v, A(H1N2)v and A(H3N2)v of swine origin caused six human infections in the United States and Sweden.

Methods

[Click here for a detailed description of the methods used to produce this annual report.](#)

Epidemiology

Avian and swine influenza in humans

Two human cases of zoonotic influenza were reported in the EU/EEA in 2014.

Avian influenza virus A(H5N1)

In 2014, the number of outbreaks and detections of highly pathogenic avian influenza virus A(H5N1) in poultry and wild birds rose compared with the years before, resulting in an increase of human cases, particularly in Egypt (see OIE and FAO) [1]. In 2014, Cambodia, China, Egypt, Indonesia and Vietnam reported 52 human cases of A(H5N1), including 22 deaths. Most cases (37 cases, including 14 deaths) occurred in Egypt at the end of 2014 [1], and ECDC published a rapid risk assessment. Similar to previous years, transmission to humans was associated with close contact to infected poultry. In January 2014, Canada reported a fatal imported case of influenza A(H5N1) infection, with symptom onset in late December 2013. This was the first confirmed human case of A(H5N1) in North America (see [epidemiological update](#)). Between 2003 and 2014, WHO reported 695 human cases due to A(H5N1), including 403 deaths (see [here](#)) worldwide.

Avian influenza virus A(H5N6)

In 2014, China reported two human cases infected with avian influenza virus A(H5N6). One was reported in April in Sichuan province, the other was reported in December in a 58-year-old man from Guangdong. The likely source of infection was exposure to infected poultry (see [WHO](#)).

Avian influenza virus A(H7N9)

Since the identification of a novel reassortant low pathogenic avian influenza A(H7N9) virus in March 2013 in China, a wave of human infections has been observed in China each winter season. Domestic human cases of A(H7N9) have been reported from China, Hong Kong and Taiwan, and Malaysia reported travel-related cases. In 2014, 334 laboratory-confirmed cases of human infection with avian influenza A(H7N9) virus were reported. The main source of infection was exposure to infected poultry or contaminated environments. No sustained human-to-human transmission was recorded, although small clusters of human cases was identified. ECDC published two rapid risk assessments on 28 January 2014 and 26 February 2014 and an epidemiological update on 7 February 2014.

Avian influenza virus A(H9N2)

Two human cases with mild illness due to avian influenza A(H9N2) were detected in China in late 2014 [1]. Given the widespread circulation of the strain in poultry in the country, it is likely that these cases were related to contact with infected poultry.

Avian influenza virus A(H10N8)

In 2014, two human cases of avian influenza A(H10N8) virus following contact to poultry were reported in Jiangxi province in China: a 55-year-old woman in January and a 75-year-old man in February ([WHO](#)).

Swine influenza virus A(H1N1)v

The United States reported one human case infected with a variant swine-origin influenza A(H1N1)v virus. The infected person reported exposure to swine before onset of symptoms [1-3].

Swine influenza virus A(H1N2)v

A reassortant influenza A(H1N2)v virus with internal genes closely related to the A(H1N1)pdm09 virus and a neuraminidase derived from a human influenza A(H3N2) virus was detected in two farmers and swine on a farm in Västra Götaland region, Sweden, during the winter 2013–2014. Both human cases were asymptomatic, and no further human infections were detected among other farmers or family members ([WHO](#)).

Swine influenza virus A(H3N2)v

In the United States, three human cases infected with influenza A(H3N2)v viruses from swine were reported in 2014 from two different states ([CDC](#), [WHO](#)) [1].

Avian influenza detections in birds and seals

Worldwide, highly pathogenic avian influenza A(H5N1) recurred in 2014 in many countries and affected poultry and wild birds. Outbreaks were reported from Cambodia, China, Egypt, India, Libya, North Korea, Nepal, Russia, and Vietnam.

New avian influenza H5 viruses with reassortment of genes between Asian and North American strains [e.g. A(H5N1), A(H5N2) and A(H5N3)] were discovered in the United States and Canada in 2014. The introduction of these viruses into poultry holdings caused large outbreaks in different countries. Detections of highly pathogenic avian influenza virus A(H5N2) were reported from Canada, China, Taiwan and the United States. A(H5N3) was detected in China and Taiwan.

Highly pathogenic avian influenza virus A(H5N6) was found in Burkina Faso, China (including Hong Kong), Laos and Vietnam.

In 2014, highly pathogenic avian influenza A(H5N8) outbreaks were reported in poultry in Germany, Italy, the Netherlands and the United Kingdom. Some of these countries also reported detections in wild birds [4]. One indoor farm in Italy and one in the United Kingdom were affected. In Germany and the Netherlands, detections were reported from several indoor farms as well as wild birds. In 2014, Canada, China, Japan, South Korea, Taiwan, Russia and the United States also reported A(H5N8) detections in wild birds or poultry. A(H5N8) was detected in chickens, different duck species, hens, turkeys, falcons and guinea fowl. No transmission to humans was reported. ECDC published two rapid risk assessments on this topic (13 November 2014 and 20 November 2014) and two epidemiological updates (13 November 2014 and 21 November 2014).

Mexico reported the only highly pathogenic H7 virus, with A(H7N3) outbreaks in poultry in 2014 (see [OIE](#)).

A new influenza virus A(H10N7) caused an epidemic in 2014, with mass mortality in seals moving from the western coast of Sweden to the eastern coast of Denmark, then to the western coast of Denmark and subsequently via the German coastline to the Netherlands [5-7]. The closest ancestor of this virus was found in wild birds, pointing to an avian-mammal transmission event.

Discussion

No human cases of avian influenza were detected in EU countries despite several outbreaks of highly pathogenic avian influenza virus in poultry holdings. However, increased numbers of human cases of avian influenza A(H5N1), A(H5N6), A(H7N9), A(H9N2) and A(H10N8) were reported outside of Europe, particularly in Egypt and China, a result of an increase in infected poultry and human exposure in those countries. The established surveillance system for human cases of avian influenza in affected countries during the last decade underlines the continuing threat of avian influenza to human health. So far, no sustained human-to-human transmission has been observed, indicating that the transmission of avian influenza to humans is a rare event and viruses have not acquired the capability to transmit between humans.

Large outbreaks in poultry in the United States and Canada and the continuous circulation of various H5 and H7 viruses in poultry and wild birds in other parts of the world are a reminder that avian influenza represents a constant threat. Transmission to mammals has not been reported for avian influenza viruses A(H5N2) and A(H5N8) despite having caused large zoonotic outbreaks in the US and Europe.

In 2014, influenza viruses of swine origin were reported to have caused human infections in Sweden and the United States.

Public health conclusions

Avian-to-human and swine-to-human transmission of influenza viruses was well documented in 2014. Influenza viruses of animal origin remain a concern for human health in Europe, given their continuing genetic evolution, the risk of reassortment with influenza viruses that are more transmissible among humans, and given the close human contact with potentially infected birds or pigs. Therefore, reassortment between swine and human viruses needs to be carefully monitored.

The emergence of new avian influenza viruses with the potential to infect humans and cause severe disease underlines the importance of surveillance in both humans and animals. Early detection of transmission to humans is essential for preventing further cases. Serological studies – particularly of highly exposed poultry farmers and workers, as part of the investigation in bird outbreaks – help to assess the risk for humans when new avian influenza viruses emerge. In order to be better prepared for a new pandemic arising from any of these new strains, WHO has published a list of candidate vaccines that are currently under development (see [WHO](#)). In the absence of a vaccine, rigorous disease control among swine and poultry as well as personal protection of people exposed to infected animals remain the most effective preventive measure.

References

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Additional information

Previous reports

<http://ecdc.europa.eu/en/publications/Publications/Respiratory-tract-infections-annual-epidemiological-report-2014.pdf>

Peer reviewed-article by ECDC epidemiologists: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20996>

Rapid Risk Assessment on H5N1 Egypt, Dec 2014:

http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List={4F55AD51-4AED-4D32-B960-AF70113DBB90}&ID=1236

Rapid Risk Assessment on H5N8, 20 Nov 2014: http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List={4F55AD51-4AED-4D32-B960-AF70113DBB90}&ID=1211

Rapid Risk Assessment on H5N8, 13 Nov 2014: http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List={4F55AD51-4AED-4D32-B960-AF70113DBB90}&ID=1202

Rapid Risk Assessment on Avian Influenza A viruses, China, Feb 2014: http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List={4F55AD51-4AED-4D32-B960-AF70113DBB90}&ID=1033

Rapid Risk Assessment on H7N9, China, Jan 2014: http://ecdc.europa.eu/en/publications/_layouts/forms/Publication_DispForm.aspx?List={4F55AD51-4AED-4D32-B960-AF70113DBB90}&ID=1011

Epidemiological update on H7N9, China, Feb 2014: http://ecdc.europa.eu/_layouts/ECDC/Portal/AnonymousCopyUtil.aspx?Use=id&Action=dispform&ItemId=950&ListId=8db7286c-fe2d-476c-9133-18ff4cb1b568&WebId=86661a14-fb61-43e0-9663-0d514841605d&SiteId=ffe386b2-8461-4318-8856-32714ec41f3a&Source=http%3A%2F%2Fecdc%2Eeuropa%2Eeu%2Fen%2Fpress%2Fepidemiological%5Fupdates%2Fpages%2Fepidemiological%5Fupdates%2Easpx%3Fp%3D4

Epidemiological update on H5N1, Canada, Jan 2014: http://ecdc.europa.eu/_layouts/ECDC/Portal/AnonymousCopyUtil.aspx?Use=id&Action=dispform&ItemId=1120&ListId=8db7286c-fe2d-476c-9133-18ff4cb1b568&WebId=86661a14-fb61-43e0-9663-0d514841605d&SiteId=ffe386b2-8461-4318-8856-32714ec41f3a&Source=http%3A%2F%2Fecdc%2Eeuropa%2Eeu%2Fen%2Fpress%2Fepidemiological%5Fupdates%2Fpages%2Fepidemiological%5Fupdates%2Easpx%3Fp%3D5

Epidemiological update on H5N8, 21 Nov 2014: http://ecdc.europa.eu/_layouts/ECDC/Portal/AnonymousCopyUtil.aspx?Use=id&Action=dispform&ItemId=1120&ListId=8db7286c-fe2d-476c-9133-18ff4cb1b568&WebId=86661a14-fb61-43e0-9663-0d514841605d&SiteId=ffe386b2-8461-4318-8856-32714ec41f3a&Source=http%3A%2F%2Fecdc%2Eeuropa%2Eeu%2Fen%2Fhealthtopics%2Favian%5Finfluenza%2Fpages%2Fnews%5Fand%5Fepidemiological%5Fupdates%2Easpx

Epidemiological update on H5N8, 13 Nov 2014: http://ecdc.europa.eu/_layouts/ECDC/Portal/AnonymousCopyUtil.aspx?Use=id&Action=dispform&ItemId=1120&ListId=8db7286c-fe2d-476c-9133-18ff4cb1b568&WebId=86661a14-fb61-43e0-9663-0d514841605d&SiteId=ffe386b2-8461-4318-8856-32714ec41f3a&Source=http%3A%2F%2Fecdc%2Eeuropa%2Eeu%2Fen%2Fhealthtopics%2Favian%5Finfluenza%2Fpages%2Fnews%5Fand%5Fepidemiological%5Fupdates%2Easpx

* The European Surveillance System (TESSy) is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals.