SURVEILLANCE REPORT

Annual Epidemiological Report for 2015

Zoonotic influenza

Key facts

- Human cases of avian influenza A(H5N1) and A(H7N9) were reported from Bangladesh, China, Egypt and Indonesia and one travel-related case of A(H7N9) in Canada.
- Sporadic human cases of avian influenza A(H5N6) and A(H9N2) were reported worldwide.
- No human cases of avian influenza were reported in the EU/EEA.
- In 2015, several outbreaks and detections in poultry and wild birds of highly pathogenic avian influenza viruses such as A(H5N1), 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 seven human infections in Brazil and the United States.

Methods

This report includes 2015 events and data and does not follow the entire winter season pattern. For a detailed description of methods used to produce this report, please refer to the *Methods* chapter [1].

An overview of the national surveillance systems is available online [2].

Additional data on influenza are accessible from ECDC's online *Surveillance atlas of infectious diseases* [3].

Avian and swine influenza in humans

No human cases of zoonotic influenza were reported in the EU/EEA in 2015.

Avian influenza virus A(H5N1)

In 2015, highly pathogenic avian influenza virus A(H5N1) caused continued outbreaks or was detected in poultry and wild birds (see OIE [4] and FAO [5]). Sporadic transmission to humans, particularly in Egypt, was observed. Bangladesh, China, Egypt and Indonesia reported 145 human cases of A(H5N1), 42 (29%) of which died. The upsurge of cases in Egypt that started at the end of 2014 continued in the first months of 2015, with 136 cases

Suggested citation: European Centre for Disease Prevention and Control. Zoonotic influenza. In: ECDC. Annual epidemiological report for 2015. Stockholm: ECDC; 2017.

Stockholm, December 2017

reported in 2015 – the highest number of human cases ever reported in a single country. In 2015, transmission patterns were similar as in previous years (cases associated with close contact to infected poultry [6]. ECDC published a rapid risk assessment in March 2015 and an epidemiological update in April 2015. Between 2003 and 2015, WHO reported 846 human cases due to A(H5N1), including 449 deaths [7].

Avian influenza virus A(H5N6)

In 2015, China reported five human cases infected with avian influenza virus A(H5N6), of which three died. The likely source of infection was exposure to dead wild birds, infected poultry or duck meat [8-10].

Avian influenza virus A(H7N9)

After the identification of the novel reassortant, low pathogenic avian influenza virus A(H7N9) in China in March 2013, human cases of A(H7N9) were reported from China, Hong Kong, and Taiwan, and both Canada and Malaysia reported travel-related cases. In 2015, WHO reported a total of 683 laboratory-confirmed human cases due to avian influenza A(H7N9) viruses, including at least 275 deaths [10]. In 2015, 213 human infections were reported in China. The main source of infection was exposure to infected poultry or contaminated environments. No sustained human-to-human transmission was recorded although clusters of human cases were identified [12].

An ECDC rapid risk assessment described a travel-related case in Canada in February 2015 [13].

Avian influenza virus A(H9N2)

In 2015, mild infections with avian influenza A(H9N2) virus in eight children and two adults were reported by Bangladesh, China and Egypt [8,14-17].

Swine influenza virus A(H1N1)v

The United States reported three human cases infected with a variant swine-origin influenza A(H1N1)v virus, including one death [8,14,18,19].

Swine influenza virus A(H1N2)v

Brazil reported one human case infected with a variant swine-origin influenza A(H1N2)v virus [17].

Swine influenza virus A(H3N2)v

The United States reported three human cases infected with swine-origin influenza A(H3N2)v viruses, two of which were admitted to hospital [10,11,14].

Avian influenza detections in birds, highly pathogenic avian influenza A(H5N8)

In 2015, Germany, Sweden and Hungary reported detection of A(H5N8) viruses in zoo birds, wild birds or poultry. Other countries reporting A(H5N8) detections in wild birds or poultry were Canada, China, Japan, South Korea, Taiwan, Russia and the United States. A(H5N8) was detected in chickens, different duck species, hens, turkeys, falcons and guinea fowl. No transmission to humans was reported.

Avian influenza detections in birds, highly pathogenic avian influenza A(H5N1)

In 2015, A(H5N1) was detected in pelicans in Romania and Bulgaria, in backyard poultry and in a wild dove during an outbreak in Bulgaria. No human cases were caused by these outbreaks. Worldwide, highly pathogenic avian influenza A(H5N1) recurred in 2015 in many countries affecting poultry and wild birds. Outbreaks were reported from Bhutan, Burkina Faso, Ivory Coast, Cambodia, Canada, China, Egypt, the Gaza Strip and the West Bank, Ghana, Indonesia, Iran, Iraq, Israel, Libya, Myanmar/Burma, Niger, Nigeria, Turkey, and Vietnam.

France reported a reassortant, highly pathogenic avian influenza virus not related to A(H5N1) circulating in Africa or south-east Asia.

Avian influenza detections in birds, new highly pathogenic avian influenza viruses of subtype A(H5)

In Europe, new reassorted avian influenza viruses of subtype A(H5), A(H5N2) and A(H5N9) were identified during large outbreaks in poultry or bird holdings in France. Other new avian influenza H5 viruses circulated in 2015, with reassortment of genes between Asian and North American strains in the United States and Canada, such as A(H5N8), A(H5N1), A(H5N2), A(H5N3).

The circulation and introduction of these viruses into poultry holdings caused large outbreaks in different countries. Since the first detection of highly pathogenic avian influenza of A(H5) in the United States in December 2014 and until the last reported detection in June 2015, more than 50 million birds were affected [20]. Detections of highly pathogenic avian influenza virus A(H5N2) were reported from Canada, China, Taiwan and the United States. Highly pathogenic avian influenza virus A(H5N3) was reported from China and Taiwan. Highly pathogenic avian influenza virus A(H5N6) was detected in Burkina Faso, China, Hong Kong, Laos and Vietnam.

Avian influenza detections in birds, high and low pathogenic avian influenza viruses of subtype H7

In 2015, outbreaks of highly pathogenic avian influenza A(H7N7) was reported from Germany and the UK. No transmission to humans was observed. A few outbreaks of low pathogenic avian influenza A(H7N7) virus were reported in poultry holdings from the UK, the Netherlands and Germany [21]. Mexico reported persistent outbreaks of highly pathogenic avian influenza A(H7N3). Low pathogenic avian influenza viruses A(H7N9) were reported from China. The virus detected in the Netherlands was not related to the A(H7N9) viruses circulating in poultry in China that caused severe infection in humans. In Italy, low pathogenic avian influenza A(H7N1) was reported. In the United States, A(H7N3) viruses were reported.

Discussion

Despite various outbreaks of highly pathogenic avian influenza virus in poultry holdings in EU/EEA countries in 2015, no human cases of avian influenza were reported. However, human cases of avian influenza A(H5N1), A(H5N6), A(H7N9) and A(H9N2) were reported from countries outside the EU/EEA. In addition, influenza viruses of swine origin caused several cases in the United States in 2015. Viruses of animal origin continue to evolve genetically and reassort with influenza viruses more transmissible and better adapted to humans. Such emerging new avian influenza viruses have the potential to infect humans and cause severe disease.

Public health implications

Zoonotic influenza viruses remain a concern for human health in Europe and surveillance needs to be rigorous. 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.

To be better prepared for a new pandemic that could be arising from any of these new strains, WHO has published a list of candidate vaccines.

References

1. European Centre for Disease Prevention and Control. Introduction to the Annual epidemiological report for 2015. In: ECDC. Annual epidemiological report for 2015. Stockholm: ECDC; 2017. Available from: https://ecdc.europa.eu/en/annual-epidemiological-reports-2016/methods.

2. European Centre for Disease Prevention and Control. Surveillance systems overview [internet]. Stockholm: ECDC; 2017. Available from: https://ecdc.europa.eu/sites/portal/files/documents/Table-surveillance_systems_overview_0.xlsx

3. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases [internet]. Stockholm: ECDC; 2017 [Cited 30 May 2017]. Available from: http://atlas.ecdc.europa.eu.

6. World Organisation for Animal Health (OIE). Update on highly pathogenic avian influenza in animals (type H5 and H7) [Internet]. OIE: Paris; 2015. Available from: http://www.oie.int/animal-health-in-the-world/update-on-avian-influenza/2015/.

5. Food and Agriculture Organization of the United Nations (FAO). Global Animal Disease Information System (EMPRES-i) [Internet]. FAO: Rome; 2016. Available from: http://empres-i.fao.org/eipws3g/.

6. World Health Organization – Regional Office for the Eastern Mediterranean. Egypt: upsurge in H5N1 human and poultry cases but no change in transmission pattern of infection. Cairo: WHO EMRO; 2016. Available from: http://www.emro.who.int/egy/egypt-news/upsurge-h5n1-human-poultry-cases-may-2015.html.

7. World Health Organization. Cumulative number of confirmed human cases for avian influenza A(H5N1) reported to WHO, 2003–2016. Geneva: WHO; 2016. Available from: http://www.who.int/influenza/human_animal_interface/2016_07_19_tableH5N1.pdf.

8. World Health Organization. Influenza at the human-animal interface, Summary and assessment as of 3 March 2015 [11 Mar 2017]. Geneva: WHO; 2015. Available from: http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_3_March_2015.pdf.

9. World Health Organization. Influenza at the human-animal interface; Summary and assessment as of 17 July 2015 [20 Sep 2016]. Geneva: WHO; 2015.Available from: http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_17_July_2015.pdf.

10. World Health Organization. Influenza at the human-animal interface; Summary and assessment as of 20 January 2016 [20 Sep 2016]. Geneva: WHO; 2016. Available from: http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_20_Jan_2016.pdf.

11. Centers for Disease Control and Prevention. Case count: detected US human infections with H3N2v by state since August 2011 [2 Mar 2017]. Atlanta: CDC; 2016. Available from: http://www.cdc.gov/flu/swineflu/h3n2v-case-count.htm

12. World Health Organization. WHO risk assessment of human infections with avian influenza A(H7N9) virus – 2015 [20 Sep 2016]. Geneva: WHO; 2015. Available from: http://www.who.int/influenza/human_animal_interface/influenza_h7n9/RiskAssessment_H7N9_23Feb20115.pdf.

13. European Centre for Disease Prevention and Control. Human infection with avian influenza A(H7N9) virus – fourth update, 2 February 2015. Stockholm: ECDC; 2015. Available from: http://ecdc.europa.eu/en/publications/Publications/RRA-Influenza-A-H7N9-update-four.pdf

14. World Health Organization. Influenza at the human-animal interface, Summary and assessment as of 4 September 2015 [20 Sep 2016]. Geneva: WHO; 2015. Available from: http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_04_September_2015.pdf.

15. World Health Organization. Influenza at the human-animal interface; Summary and assessment as of 14 December 2015 [20 Sep 2016]. Geneva: WHO; 2015. Available from: http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_14_Dec_2015.pdf.

16. World Health Organization. Influenza at the human-animal interface, Summary and assessment as of 23 June 2015 [20 Sep 2016]. Geneva: WHO; 2015. Available from: http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_23_June_2015.pdf.

17. World Health Organization (WHO). Influenza at the human-animal interface; Summary and assessment, 20 July to 3 October 2016 [07/12/2016]. Geneva: WHO; 2016. Available from: http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_10_03_2016.pdf.

18. Appiah GD, Blanton L, D'Mello T, Kniss K, Smith S, Mustaquim D, et al. Influenza activity – United States, 2014–15 season and composition of the 2015–16 influenza vaccine. MMWR Morb Mortal Wkly Rep. 2015 Jun 5;64(21):583-90.

19. Blanton L, Kniss K, Smith S, Mustaquim D, Steffens C, Flannery B, et al. Update: Influenza activity – United States and worldwide, May 24–September 5, 2015. MMWR Morb Mortal Wkly Rep. 2015 Sep 18;64(36):1011-6.

20. United States Department of Agriculture, Animal and Plant Health Inspection Service. HPAI 2014/15 confirmed detections [5 Apr 2016]. Washington, DC: USDA; 2015.

21. European Centre for Disease Prevention and Control. Human infection by low pathogenic avian influenza A(H7) viruses – 11 February 2015. Stockholm: ECDC; 2015. Available from: http://ecdc.europa.eu/en/publications/Publications/RRA-Influenza-A-H7.pdf.