



RAPID RISK ASSESSMENT

Outbreak of highly pathogenic avian influenza A(H5N8) in Germany

13 November 2014

Main conclusions and recommendations

On 6 November 2014, German authorities reported an outbreak of highly pathogenic avian influenza virus A(H5N8) at a turkey holding. Culling of the turkeys at the affected holding has started, protection and surveillance zones have been established, and investigations initiated to establish how the birds became infected.

This virus has been detected among wild birds in south-east Asia where it has also caused several outbreaks on commercial poultry farms in South Korea and China. However, this is the first time it has been detected in Europe. It remains unclear how this virus was introduced into a turkey flock at a German holding.

The public health threat from this event is considered very low. To date, no human infections with this virus have ever been reported world-wide and the risk for zoonotic transmission to the general public in the EU/EEA countries is considered to be extremely low. The ability of this highly pathogenic avian influenza virus to sub-clinically infect wild birds increases the risk of geographical spread and subsequent outbreaks, as observed in South Korea. The ongoing monitoring and testing of wild birds and domestic poultry in the EU therefore plays an important role in the possible detection of further virus occurrences.

In order to prevent virus spread the Directive 2005/94/EC requires that Member States have contingency plans detailing measures for the killing and safe disposal of infected poultry, feed and contaminated equipment as well as the procedures and methods for cleaning and disinfection. Persons at risk are mainly people in direct contact/handling diseased turkeys and other poultry, or their carcasses (e.g. farmers, veterinarians and those labourers involved in the culling.) It is further required that contingency plans for the control of avian influenza in poultry and birds be developed in collaboration with public health authorities to foresee that persons at risk are sufficiently protected from infection.

Poultry workers exposed at the affected holding should be monitored for ten days in order to document possible related symptoms. Local health authorities may consider actively monitoring these groups.

Source and date of request

EC SANCO C3 Health Threats request to ECDC dated 6 November 2014.

Public health issue

This Rapid Risk Assessment (RRA) summarises the epidemiological, virological and environmental information relating to an outbreak of highly pathogenic avian influenza A virus subtype H5N8 at a German turkey holding in November 2014, and assesses the risk to public health in the EU/EEA associated with the outbreak. It builds on the *Rapid Risk Assessment of Human infections with avian influenza A viruses, China*, which relates to A(H7N9) and A(H5N1).

Consulted experts

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Disease background information

Outbreaks caused by highly pathogenic avian influenza* A(H5N8) viruses have been reported from south-east Asia since 2010. The A(H5N8) virus was first detected in domestic ducks in China during routine surveillance activities at a live poultry market [1]. Since the beginning of 2014, several outbreaks involving novel reassortant influenza A(H5N8) viruses have been detected in poultry and wild bird species in South Korea [2-4] as well as in China [1,5,6]. The viruses have been detected in captured and apparently healthy wild migratory birds and dead wild birds, as well as in domestic chickens, geese and ducks [4,5]. Avian influenza A(H5N8) viruses have shown moderate pathogenicity in domestic ducks in South Korea (0–20% mortality rate) and do not cause severe illness or death in wild mallard ducks. One study reported that viral replication and shedding was greater in mallards infected with A(H5N8) influenza viruses than in mallards infected with A(H5N1) viruses. Transmission of A(H5N8) viruses between wild bird species and poultry/domestic birds may occur by direct contact. Mammals such as ferrets, dogs and cats can be infected experimentally, but results indicate that a recent H5N8 isolate was less virulent in mice and ferrets than (A)H5N1 in mammalian species [7]. Natural infection of dogs with A(H5N8) has been reported from South Korea. Avian influenza A(H5N8) viruses from South Korea bind strongly to alpha 2-3 sialic receptors and, to a lesser degree, to alpha 2-6 receptors [7]. However, the results from the ferret model are inconclusive in terms of virulence for humans.

The spread of the virus may occur via migratory bird flyways [5,8].

Legal import of live poultry and live captive birds into the EU is not authorised from the east Asian region. Treated egg products and eggs for processing may be imported into the EU from South Korea and China. Heat-treated poultry meat products are authorised for import into the EU from South Korea and from one Chinese province (Shandong). No imports of any poultry commodities are permitted from Japan, where outbreaks caused by the H5N8 virus have also occurred. Given the very heat-labile nature of all influenza viruses, these commodities are not considered to pose a risk of influenza virus transmission to consumers.

No human cases of avian influenza A(H5N8) have been reported related to the current circulating virus.

Event background information

Germany notified the European Commission and the World Organisation for Animal Health (OIE) on 6 November 2014 of an outbreak of highly pathogenic avian influenza of subtype H5N8 at a poultry holding in the north-east of Germany [9]. The holding was keeping approximately 31 000 fattening turkeys, 5 000 of which were infected, and 1 880 died within two days. The outbreak affected 15-week-old birds in one of five sheds at the holding. An increase in mortality was observed after 1 November 2014 and a private laboratory subsequently identified an avian influenza A(H5) virus. The National Reference Laboratory for avian influenza at the Friedrich-Loeffler-Institute (FLI) in Germany confirmed the highly pathogenic avian influenza A(H5N8) on 5 November 2014. The virus is of South Korean origin, clustering in clade 2.3.4.6. There was no evidence of this virus being present in wild birds captured for routine

* According to Council Directive 2005/94/EC: 'highly pathogenic avian influenza (HPAI)' means an infection of poultry or other captive birds caused by:

- avian influenza viruses of the subtypes H5 or H7 with genome sequences codifying for multiple basic amino acids at the cleavage site of the haemagglutinin molecule similar to that observed for other HPAI viruses, indicating that the haemagglutinin molecule can be cleaved by a host ubiquitous protease; or
- avian influenza viruses with an intravenous pathogenicity index in six-week old chickens greater than 1.2;2.

surveillance. The reference laboratory reported that the virus is detectable using EU-recommended laboratory methods (M 1.2 and H5).

The authorities placed the infected holding under restrictions as of 4 November 2014 and took measures required by Directive 2005/94/EC, including the establishment of a protection zone of 3 km radius and a surveillance zone of 10 km radius [10]. Culling and safe disposal of the turkeys at the infected holding started on 6 November 2014 and poultry kept at other farms located within the protection zone were also culled. These actions were completed by 8 November 2014.

Investigations have been initiated at poultry holdings within the surveillance zone to try to determine how the virus entered the turkey holding. Germany reported that no live poultry or poultry meat from the affected holding has been shipped to other regions of Germany, other EU Member States or third countries.

ECDC threat assessment for the EU

The public health threat from this event is considered very low. To date, no human infections with this virus have ever been reported world-wide and the risk for zoonotic transmission to the general public in the EU/EEA countries is considered to be extremely low.

In order to prevent virus spread the Directive 2005/94/EC [10] requires that Member States have contingency plans detailing measures for the killing and safe disposal of infected poultry, feed and contaminated equipment as well as the procedures and methods for cleaning and disinfection. Persons at risk are mainly people in direct contact/handling diseased turkeys and other poultry, or their carcasses (e.g. farmers, veterinarians and those labourers involved in the culling.) It is further required that contingency plans for the control of avian influenza in poultry and birds must be developed in collaboration with the public health authorities to foresee that persons at risk are sufficiently protected from infection.

Persons in direct contact with infected poultry before or during culling and disposal should inform authorities and healthcare providers about the exposure if they develop influenza-like illness or other symptoms, such as fever or conjunctivitis.

To date, there is no epidemiological evidence that avian influenza can be transmitted to humans through the consumption of cooked food, notably poultry meat and eggs.

Conclusions

There is wide diversity in the re-assorted avian influenza viruses circulating in wild bird populations across south-east Asia. The ability of this highly pathogenic avian influenza virus to sub-clinically infect wild birds increases the risk of geographical spread and subsequent outbreaks, as observed in South Korea. The ongoing monitoring and testing of wild birds and domestic poultry in the EU therefore plays an important role in the possible detection of further virus occurrences.

It remains unclear how this virus was introduced into a turkey flock at a German holding. The ongoing investigations into the probable transmission chain may provide information that could be important for the prevention of further outbreaks in the EU.

Poultry workers exposed at the affected holding should be monitored for ten days, in order to document possible related symptoms. Local health authorities may consider actively monitoring these groups.

References

1. Wu H, Peng X, Xu L, Jin C, Cheng L, Lu X, et al. Novel reassortant influenza A(H5N8) viruses in domestic ducks, eastern China. *Emerging infectious diseases*. 2014 Aug;20(8):1315-8.
2. Lee YJ, Kang HM, Lee EK, Song BM, Jeong J, Kwon YK, et al. Novel reassortant influenza A(H5N8) viruses, South Korea, 2014. *Emerging infectious diseases*. 2014 Jun;20(6):1087-9.
3. Ku KB, Park EH, Yum J, Kim JA, Oh SK, Seo SH. Highly pathogenic avian influenza A(H5N8) virus from waterfowl, South Korea, 2014. *Emerging infectious diseases*. 2014 Sep;20(9):1587-8.
4. Jeong J, Kang HM, Lee EK, Song BM, Kwon YK, Kim HR, et al. Highly pathogenic avian influenza virus (H5N8) in domestic poultry and its relationship with migratory birds in South Korea during 2014. *Veterinary microbiology*. 2014 Oct 10;173(3-4):249-57.
5. Fan S, Zhou L, Wu D, Gao X, Pei E, Wang T, et al. A novel highly pathogenic H5N8 avian influenza virus isolated from a wild duck in China. *Influenza Other Respir Viruses*. 2014 Nov 1.
6. Zhao K, Gu M, Zhong L, Duan Z, Zhang Y, Zhu Y, et al. Characterization of three H5N5 and one H5N8 highly pathogenic avian influenza viruses in China. *Veterinary microbiology*. 2013 May 3;163(3-4):351-7.
7. Kim Y-I, Pascua PNQ, Kwon H-I, Lim G-J, Kim E-H, Yoon S-W, et al. Pathobiological features of a novel, highly pathogenic avian influenza A(H5N8) virus. *Emerg Microbes Infect*. 2014 10/22/online;3:e75.
8. Kang HM, Lee EK, Song BM, Jeong J, Choi JG, Jeong J, et al. Novel reassortant influenza A(H5N8) viruses among domestic and wild ducks, South Korea, 2014. *Emerging infectious diseases*. 2015 Feb.
9. OIE. 06/11/2014: Highly pathogenic avian influenza H5N8, Germany, (immediate notification) [10 Nov 2014]. Available at:
http://www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=16474.
10. European Commission. Council Directive 2005/94/EC of 20 December 2005 on Community measures for the control of avian influenza and repealing Directive 92/40/EEC [10 Nov 2014]. Available from: <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1415609228714&uri=CELEX:32005L0094>.