Department for Environment, Food and Rural Affairs
Animal & Plant Health Agency
Veterinary & Science Policy Advice Team - International Disease Monitoring

Updated Outbreak Assessment number 13

Highly Pathogenic Avian Influenza H5N8 in the UK and Europe

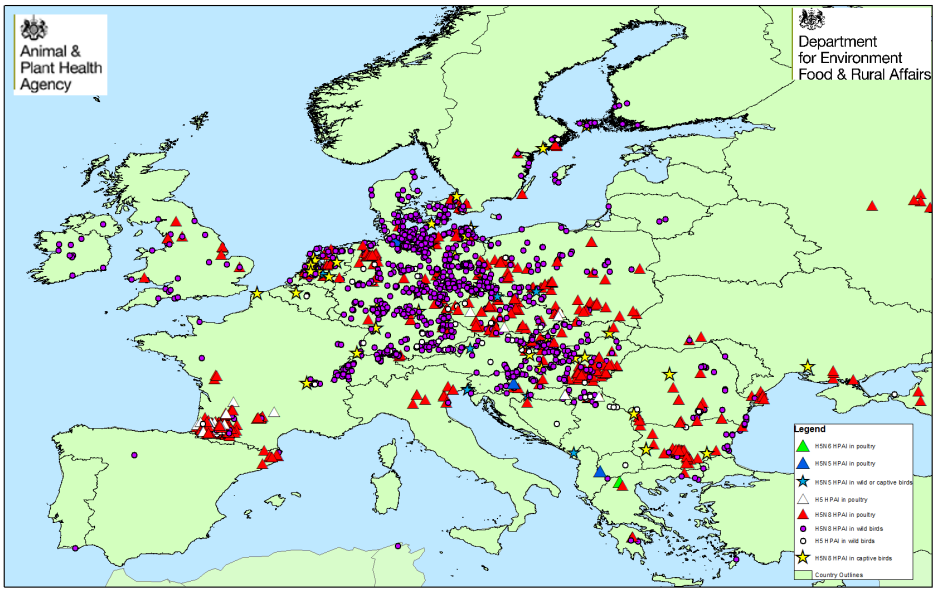
5th April 2017 Ref: VITT/1200 Avian Influenza in UK & Europe

Disease report

Since our last update on the 8th March 2017, all the restriction zones around the Suffolk and Northumberland premises have been lifted and there are no longer any disease control zones present in the UK. The AI Prevention Zones remain in place across the UK. The last wild bird to be tested positive for H5N8 was reported on the 10th March, in the South West of England, where other infected birds had previously been found. Wild bird surveillance is continuing but given that this relies on passive surveillance of dead birds, the numbers have reduced considerably in the last few weeks. This could reflect reduced surveillance and reduced disease risk, as the temperatures have increased, mortality rates will decrease and many of the migratory waterfowl have now left the UK.

Situation assessment

Although there have been no outbreaks in the UK since our last report (8th March 2017), there have been 53 new outbreaks of H5N8 or H5 HPAI in domestic poultry, 6 in captive birds and 165 reports in wild birds, in a total of 21 countries across Europe. These numbers do not include those reported in the South West region of France, where a large depopulation exercise is underway and poultry farms are being tested as part of this exercise. France has reported 168 holdings testing positive for H5N8 or H5 in the same time period. Otherwise, the



greatest increase in poultry has been in Germany and Romania where just fewer than twenty new outbreaks have been reported in each. The Romanian outbreaks have mainly been seen in backyard farms in one region (Teleorman region) while in Germany the outbreaks have been detected in fattening turkeys and some other poultry, mainly in Lower Saxony. Germany has reported a high number of wild bird findings, but we stress again, that the sensitivity of the different surveillance systems in different Member States makes it difficult to compare one to another. In the same manner, comparing Europe to the rest of the world is also unlikely to reflect the true situation as our surveillance systems are more sensitive than other regions of the world.

Total number of findings of H5N8 HPAI since November 2016:

	H5N8 in domestic poultry	H5N8 in captive birds	H5N8 in wild birds	H5N5 or H5N6 – all birds
European Union Member States*	1090	51	1404	14
Rest of Europe	25	3	90	2
North Africa, Middle East, East and West Africa	3	1	2	0
Asia	59	0	21	72

*includes the outbreaks of H5 where N type has not been reported

The overall risk level for the UK (which includes entry and exposure) relates to (i) the current disease situation in Europe and in the UK; (ii) the level of wild bird migration; (iii) the likelihood of virus circulating in non-migratory birds and; (iv) the temperature which affects virus persistence in the environment.

i) The rate of disease reporting broadly across the EU has not decreased significantly in the last few weeks. Wild birds are still being found dead and testing positive, while there are still uncertainties around the level of infection present in apparently healthy wild waterfowl or in species such as corvids, passerines, gulls and others including birds of prey. There have been no positive findings in poultry or in wild birds in the UK since early March, and our disease control zones have just been lifted.

ii) Concerning the presence of migratory waterfowl, birds which have overwintered in the UK are starting to move northeast on their spring migration to their breeding grounds in the Arctic tundra. According to expert opinion, the migratory waterfowl in the UK started to leave their wintering sites in January. Expert opinion considers that around 2/3 of the migratory wild waterfowl have left the UK with the remainder leaving over the coming weeks. Those resident wild waterfowl which have remained in the UK will be starting to breed, so they become more territorial, are less mobile and less gregarious. Therefore they are less likely to forage long distances, though this can depend on local availability of food.

iii) On the likelihood of virus circulating in wild non-migratory waterfowl, in the UK, mallards (*Anas platyrhynchos*) from areas outside the migration sites and gulls have tested positive during the course of the outbreaks; across Europe, many other non-migratory species have tested positive and the relative increase in Mute swans testing positive in Europe supports spread in local, largely sedentary populations. Therefore it is reasonable to expect non-migratory birds to be infected in some areas. Waterfowl may excrete virus for several days up to two weeks for some strains based on limited published data. Therefore if birds are particularly gregarious and mix well with other species, there will be increased viral transmission. It should be noted that the basic reproductive ratio (R_0) depends on the number of susceptible birds in a given region and the level of mixing between birds. With the recent departure of many waterfowl, the number of susceptible birds will have fallen significantly such that the outbreak in wild waterfowl in the UK may not be self-sustaining.

iv) There is evidence that spread of H5N1 HPAI viruses during the European epizootic of 2005-6 is associated with air temperatures close to freezing i.e. the 0°C isotherm (Reperant et al. 2010). This not only reflects waterbird movement and congregation in cold weather but also the increased survival of the virus may be able to persist in the environment for at least 55 days in low temperatures. However, as with other avian influenza viruses, decay (virus destruction) will increase as temperature increases and sunlight hours lengthen. Avian influenza viruses will persist better in high humidity or in fresh or brackish water, and studies with H5N1 HPAI viruses from the European epizootic of 2005-6 suggested virus can remain infective in fresh water at 17^{o}C for 158 days (under lab conditions and pure water) (Reperant et al., 2010), although this does not preclude significant decay occurring during that time with associated risk for further infection also declining. A recent paper by Li and colleagues (Li *et al*., 2017) reported on a large wild bird die-off in migratory wild birds in Lake Qinghai, China that were infected with H5N8 HPAI. What was interesting about this paper was that the die off was not only affecting two species of migratory birds, brown headed gulls (*Larus brunnicephalus*) and great black headed gulls (or Pallas's gull) (*Larus ichthyaetus*) but also breeding (sedentary) bar headed geese (*Anser indicus*) and that the die off occurred in May to June when the average air temperature would be around 10-12^{o}C and can occasionally be higher (http://www.yr.no/place/China/Qinghai/Qinghai_Lake/statistics.html). Therefore the current temperatures in Europe, even though there is currently a warm spring across mainland Europe with temperatures forecast to be at least 2^{o}C above average in the next month (Met Office, per comm), this may not reduce virus infectivity at a significantly faster rate.

Therefore the long term persistence of H5N8 virus in a wild bird population corresponds to the number of susceptible birds, their mixing and the environmental temperature. Even during a relatively warm, late spring / early summer, H5N8 viruses can spread through susceptible waterfowl and therefore may still present a risk to domestic poultry. However, the risk for a new incursion occurring in wild birds is reduced compared to the winter because of fewer infected migrating waterfowl arriving and fewer susceptible waterfowl with reduced contact due to less gregarious behaviour through spring/early summer. The risk to poultry farms will depend on the virus contamination and persistence in the environment, but there is uncertainty around how many wild birds are still contributing to this, through virus shedding. Direct contact between the waterfowl and poultry populations

may be less likely, but there remains a risk from indirect contact, for example through bridging species, vermin or fomite transmission.

A review of the recent wild surveillance in GB showed that certain sites, namely those run by the NGOs, have continued to monitor for dead birds, but have not found any and therefore submissions have dropped in recent weeks, from a high of 55 per week to current level of around ten per week.

As a result of the continuing reporting in the EU and a review of the migration patterns, the risk level for the UK for a new disease incursion of any avian influenza virus into an infected wild bird is reduced to "**MEDIUM**", given the above reason. The risk of infection still being present in the UK, either circulating in non-migratory wild birds or present in the environment in some areas is still "**HIGH**". Therefore, the risk for poultry remains as "**LOW TO MEDIUM**" for introduction of infection onto individual premises and this is because it is likely there is still environmental contamination present and therefore bridging species (wild birds which may regularly visit poultry farms, such as corvids and gulls) or vermin may still be able to carry AI infection into poultry.

In response to the increase in positive findings in wild birds in Europe, we ask that the public use the **Defra helpline (Tel: 03459 33 55 77)** to report findings of dead wild birds. In particular, any wild ducks, wild geese, swans, gulls or birds of prey and where more than five birds of any species are found dead in the same location. The threshold has been reduced so that any single wild waterfowl, including resident birds, will be collected for testing.

Further information is available here: https://www.gov.uk/guidance/avian-influenza-bird-flu including updated biosecurity advice for poultry keepers which they should take note of: https://www.gov.uk/guidance/avian-influenza-bird-flu#prevention-zone

Conclusion

We consider the risk level is reduced to medium for further introductions via migratory wild birds, but the risk of exposure in native wild waterfowl remains high but with considerable uncertainty and the exposure to poultry farms remains as low to medium depending on the level of biosecurity. We will keep this carefully under review, as the spring progresses and as our enhanced surveillance delivers results.

We would like to remind all poultry keepers that the clinical signs of this virus are variable and will depend on the species, but any suspicion of production drop, increased mortality, sick and depressed birds with a temperature and neurological signs should be initially discussed with their private veterinarian.

We will continue to report on the situation

Authors

International Disease Monitoring team

References

For all disease outbreaks, more information is available on the OIE website at
http://www.oie.int/wahis_2/public/wahid.php/Diseaseinformation/WI

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Reperant, L.A., Fučkaer, N.S., Osterhaus, A.D.M.E, Dobson, A.P. & Kuiken, T. (2010) Spatial and temporal association of outbreaks of H5N1 influenza virus infection in wild birds with the 0°C isotherm. PLoS Pathogen 6 (4): e1000854 doi:10.1371/journal.ppat.1000854.

See also:
https://www.gov.uk/guidance/avian-influenza-bird-flu ;
http://gov.wales/topics/environmentcountryside/ahw/poultry/bird-gatherings-advice/?lang=en ;
http://gov.scot/avianinfluenza

For up-to-date information on the situation in the EU, also see the Commission website at https://ec.europa.eu/food/animals/animal-diseases/control-measures/avian-influenza_en

See our interactive map at https://iadm.carto.com/me

This publication is available at https://www.gov.uk/government/collections/animal-diseases-international-monitoring

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