Rapid Risk Assessment on the finding of H5N6 HPAI in wild birds in England and Wales

22nd January 2018
Summary

This document is an update of a rapid risk assessment made on the 14th January in response to a finding of H5N6 HPAI in Dorset and follows new findings in wild birds and a revision to the original risk question. The same strain of virus has now been detected in wild water birds in Warwickshire and Hertfordshire and this changes the risk assessment. All updates made on the 22nd January are shown in red for ease of reference.

In December 2017, the Netherlands reported a new strain of H5N6 HPAI in a duck fattening farm in Flevoland; several cases in wild birds (mute swans, *Cygnus olor*) in the same region and cases in captive birds at a single site (mallard ducks, mute swans, greylag geese and guinea fowl) were reported in the following days. In late December / early January two further cases in wild birds were reported, one in southern Germany and one in west Switzerland. In January 2018, three mute swans were found dead and tested positive for H5N6 HPAI in Dorset, on the South coast of England and initial analysis confirms this virus has the same characteristics as the Netherlands strain. The current numbers, as of 12th January, are 15 mute swans, 1 Canada goose and 1 pochard, all found dead and all testing positive. There have been no reports in domestic poultry, either commercial or small holding premises.

On the 11th January, a second site was reported to the authorities. A large wild bird die-off involving nearly 70 birds was observed by the site warden and 17 of the assemblage were sent to the EU/OIE/FAO AI Reference Lab for testing. Thirteen birds of mixed species tested positive for H5N6 HPAI and this was confirmed on the 16th January. The site is a known gull roost in the Midlands, with several thousand gulls roosting at the site over the winter months. Other migratory and resident wild waterfowl are also regularly reported from the site. On the 19th January another submission of wild birds found dead at a third site in Hertfordshire tested positive for H5N6. The submission included 19 wild waterfowl and gulls. The site is in one of the Higher Risk Areas (European Implementing Decision 2017/263), identified by the high number of migratory wild waterfowl that overwinter there.

This rapid risk assessment is to gather the evidence and assess the likely source of infection and the risk of spread of the virus to poultry or to wild birds in England and Wales, in the context of the background risk level from migratory wild birds.

The assessment suggests that there is now an increase in the likelihood of finding more cases in wild birds in England and Wales as a result of this finding, which increases this risk level to HIGH in comparison to the previous national risk of incursion level (MEDIUM). At a local level, around the site in Dorset, there would be a slight increase in the risk of spread for poultry on poultry farms in the immediate area, where poultry mix with wild birds, but there is some uncertainty around the role of bridging species and the modes and risk of fomite spread into the local environment. The new site in Warwickshire is the roost of many gulls of various species, several of which are migratory and local ornithological expertise suggests they will travel long distances as part of their migration and relatively long distances on their daily commute between feeding sites and roosting sites. The third
site hosts a substantial number of waterfowl and other water birds including gulls which were amongst those tested positive for H5N6. Infected gulls may act as bridging species for poultry farms or through transmission to other water birds and waterfowl. The uncertainty around the length of time disease has been present and the probability of a greater geographical spread of infection in wild birds has increased the risk level for the direct and indirect exposure to poultry to MEDIUM although this will depend on the biosecurity level at the holding level. Where strong biosecurity is implemented, the risk may be mitigated to low.

Introduction

During the winter and spring of 2016-2017 the most significant epizootic across Europe of highly pathogenic avian influenza (HPAI) occurred, eventually affecting 26 of the 28 member states as well as non-EU countries, from Europe to Asia and Africa. The virus concerned, H5N8 HPAI was detected in multiple species of wild birds, in particular wild waterfowl, causing large die-offs. Most poultry species showed some clinical signs, with Galliforme species being the most affected, where high mortality rates were reported. For a full over-view of the situation in the EU, see the EFSA opinions (EFSA 2017a & b).

In Asia, several strains of H5 virus are circulating in wild birds and poultry and these were being monitored closely, with an expectation that the wild bird migration routes may bring such viruses to Europe within a matter of months, during the migration season. This pattern has been repeated over several years and the strains of most concern were viruses from the clade 2.3.4.4 which were reported as spreading rapidly around Asia. In February 2017 there was a single incursion in Europe of H5N6 HPAI in a backyard farm of just 60 poultry; no further cases were reported and the virus was not related to the zoonotic strains in Asia (EFSA Panel, 2017). The arrival of H5N6 HPAI in NW Europe in December 2017 was therefore anticipated. The risk level for wild bird incursion was raised to MEDIUM from LOW in October 2017 on the basis of H5N8 HPAI in Europe and the wild bird findings in Germany that month (Defra, 2017a). The finding of H5N6 HPAI in the Netherlands in December did not change that risk level, but it focussed our diagnostic capability for detecting this virus in any wild birds found dead or poultry report cases (Defra, 2017b).

On January 8\textsuperscript{th} 2018, five mute swans were found dead at a site in Dorset on the South coast of England. Three of the five tested positive for H5N6 tests and showed genetic markers for high pathogenicity. Further sequencing confirmed this virus is closely related to the European strains. More birds were found at the Dorset site and tested positive – 20 more mute swans, 1 Canada goose and 1 pochard; surveillance continues. On the 11\textsuperscript{th} January, a large wild bird die-off was reported from a large gull roost area in Warwickshire. Thirteen birds tested positive: 6 great black-backed gulls, 1 herring gull, 1 great crested grebe and 5 tufted ducks. Of the remaining birds found dead, there was a grey heron (tested negative), a greylag goose (not tested) and multiple other gulls. Many birds were either decomposed or had been predated, therefore estimates of the length of time since
virus incursion are difficult to make, as indeed are estimates of the geographic bound for the virus and associated risk.

On the 19th January, at a nature reserve in Hertfordshire, another assemblage of dead wild birds was found and tested positive for H5N6. Among the 20 submissions, positive results were obtained from mallards, tufted ducks, greylag geese and a common gull.

Methodology

The OIE qualitative risk assessment methodology is used to assess the likelihood of entry and spread into poultry through the movement of wild birds or through indirect contact with the affected area.

Table 1: Risk levels are according to EFSA guidance with expanded definitions derived from Kahn et al. 1999):

<table>
<thead>
<tr>
<th>Probability</th>
<th>Definition from EFSA</th>
<th>Expanded description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligible</td>
<td>Event is so rare, does not merit consideration</td>
<td>The chance of the event occurring is so small it does not merit consideration in practical terms; it is not expected to happen for many years, if at all;</td>
</tr>
<tr>
<td>Very Low</td>
<td>Event is very rare, but cannot be excluded</td>
<td>The event is not expected to occur (very rare) in the next few years but it is possible</td>
</tr>
<tr>
<td>Low</td>
<td>Event is rare, but could occur</td>
<td>The event may occur occasionally (rare) but could occur in the next few years</td>
</tr>
<tr>
<td>Medium</td>
<td>Event occurs regularly</td>
<td>The event is possible within the next year</td>
</tr>
<tr>
<td>High</td>
<td>Event occurs very often</td>
<td>The event is expected to occur within the next year</td>
</tr>
</tbody>
</table>

Definitions

Waterfowl: Including birds of the Anatidae family such as swans, dabbling and diving ducks and wild geese.

Water birds: Other birds living in or around water, excluding the Anatidae, including gulls, waders, shore birds, herons and coots.

Hazard identification

H5N6 HPAI viruses of the clades 2.3.4.4c and d were detected first in China in 2014 and then continued to spread in poultry in China, Laos, Cambodia, South Korea, Vietnam and
Japan and some viruses in clade 2.3.4.4c have zoonotic potential and caused a small number of human cases (EFSA Panel, 2017).

According to a Promed report on 13 December 2017, “The OIE/FAO/EU International Reference Laboratory at APHA-Weybridge, UK, working with the Animal and Plant Quarantine Agency of the Republic of Korea, characterized a novel emerging highly pathogenic avian influenza A(HPAI) (H5N6) virus isolated from both wild birds and domestic poultry in the Republic of Korea. Phylogenetic analyses of a representative of these viruses showed that it was different from previously circulating Korean H5N6 viruses in the 2016-2017 winter season and which had caused a very limited number of human cases. All genes of the novel HPAI virus except the neuraminidase were of the "European H5N8 HPAI lineage" that emerged last winter (16/17) and continues to be detected in some European countries. The neuraminidase N6 is most similar to the H5N6 reassortant virus isolated from chickens in Greece in early 2017, which had acquired a neuraminidase gene from the Eurasian low pathogenic avian influenza A virus lineage circulating in wild birds. These analyses demonstrate continued circulation of this H5 lineage in multiple geographic regions and likely wild-bird mediated spread.” See also Lee et al, 2017.

The current season (winter 2017/2018) has seen several outbreaks in poultry and cases in wild birds of H5N8 HPAI in Italy, Bulgaria and Germany (see Figure 1), but none in the northerly part of the EU; further outbreaks of H5N8 HPAI cannot be ruled out since the virus continues to circulate elsewhere including the Middle East and South Africa.

In December 2017, the Netherlands reported a single outbreak of avian influenza in fattening ducks in Flevoland region (OIE, 2017). Four week old ducks showed increased clinical signs and increased mortality. The birds tested positive at the National Reference Laboratory and the virus was confirmed as H5N6 HPAI; disease control measures were put in place, including a housing requirement for all commercial poultry. According to the Dutch laboratory, the sequence shows this was a reassortant between a low pathogenic HxN6 strain and the circulating Eurasian H5N8 HPAI strain (Wageningen, 2017). Further cases in wild mute swans were reported during December and January (OIE, 2017). At the end of December, Switzerland reported a case of H5N6 HPAI in a wild mute swan and on the 8th January, Germany reported a case of H5N6 HPAI in a wild duck (species not known; OIE, 2017). The H5N6 HPAI currently in Europe therefore appears to be an emerging strain.

On the 8th January, three dead mute swans reported from a wild waterfowl site in the county of Dorset were submitted for testing to the EU/OIE/FAO reference laboratory in Weybridge. On the 9th January, the samples were confirmed positive for H5N6 HPAI. The virus is closely related to the viruses isolated in the Netherlands and presumed to be similar to those isolated in wild birds in Germany and Switzerland. Phylogenetic analyses of selected representatives of these novel H5N6 viruses showed the haemagglutinin gene is very similar to that of the previously circulating H5 clade 2.3.4.4 H5N8 viruses in the 16-17 winter season. In addition, the neuraminidase N6 is most similar to the H5N6 reassortant virus isolated from chickens in Greece in early 2017, which had acquired a
neuraminidase gene from the Eurasian low pathogenicity avian influenza A virus (LPAIV) lineage circulating in wild birds.

For the Dorset site, between the 1st and the 11th January, the dead wild bird count was 23 mute swans, 1 Canada goose and 1 pochard. A further 8 swans found dead tested positive on the 14th January. Two further sites in Warwickshire and Hertfordshire have been identified. Three species of gull (Common, Herring and Great Black-backed), Tufted ducks, greylag geese, mallards and a Great Crested Grebe have tested positive for H5N6. Therefore the species list is growing although there have still been no cases reported in gallinaceous poultry.

Figure 1: Reports of H5N6 HPAI and H5N8 HPAI since October 2017 (data from the EU Animal Disease Notification System).

During the winter and spring of 2016-2017 there were multiple outbreaks of H5N8 HPAI in poultry and captive birds and cases in wild birds across Europe. When compared to this year and the H5N6 HPAI outbreaks on the Continent (see Figure 2 below) it is clear that the level of infection pressure is far lower this year than at the same time last year. This meant the risk level for the UK was considerably higher earlier in the season in 2016/2017. There are of course caveats to these data – the new strain of H5N6 HPAI may not be causing such high levels of mortality in wild waterfowl as was seen with H5N8 HPAI in 2016/2017; the waterfowl may exhibit some resistance to infection if they had previously been exposed to H5N8 HPAI virus; the findings in mute swans above other species could be increased susceptibility, exposure or simply they are easier to find when they die.
Nevertheless, there can also be similarities drawn with the 2014/2015 winter when the first cases of H5N8 HPAI were detected in the EU, and which caused only a very limited number of outbreaks (only 9 commercial premises) and cases in Germany, Italy, Netherlands and the UK (Adlhoch et al. 2014). The new finding in gulls is interesting; the Warwickshire site represents the first large wild bird die-off involving this strain of virus and the first finding in gulls. However, testing of gulls is not frequently done in Europe, mainly because of the large number which may be found dead from other causes. During the 2016/2017 epizootic there were multiple findings of H5N8 HPAI in gulls (EFSA, 2017a), including Herring gulls (41 findings in 7 countries), Black-headed gulls (22 findings in 8 countries) and Great Black-backed gulls (16 findings in 4 countries) out of nearly two thousand reported findings in all member states.

Figure 1: Reports of H5N8 HPAI in captive birds, wild birds and poultry from October 2016 to 9th January 2018. Reports of H5N6 HPAI are superimposed to demonstrate the difference in the infection pressure.

Risk assessment

Risk question

What is the likelihood of further findings in wild birds (migratory or resident) across England and Wales occurring at new sites in addition to those in Dorset, Warwickshire and Hertfordshire?
What is the likelihood of the finding of H5N6 in a poultry holding in England and Wales as a result of exposure to infected wild birds?

The risk assessment will consider the likely source of infection at the sites under the entry assessment and then the spread to poultry as the exposure assessment.

This document will not consider the public health aspects of the virus. Consequence assessment will only cover the impact of an outbreak in poultry premises.

**Entry assessment**

1. Migratory wild birds arriving at the Fleet area in Dorset were the source of infection at the site - **high likelihood; low uncertainty**

2. Migratory wild birds arriving at the sites in Warwickshire and Hertfordshire as the source of infection at the site - **medium likelihood; medium uncertainty**

3. The source of infection was spread from an existing poultry farm with undetected infection – **very low likelihood; low uncertainty**

4. The source of infection was spread from resident wild birds (or other migratory birds) at a separate site within GB - **medium likelihood; medium uncertainty**

5. The source of infection was spread through indirect contact (fomites, products of animal origin etc) - **low likelihood; medium uncertainty**

**Evidence:**

**Migratory birds at the site (Dorset):**

Previous ornithological surveys at the site on the Fleet River have reported high numbers of both resident and migratory wild waterfowl. Last year, in January 2017, there were the resident population of mute swans (~200) and around 250 other dabbling ducks (shoveler, wigeon, teal, and mallard), diving ducks (pochard and tufted ducks) and Canada geese as well as other waterfowl, such as cormorants and coots. The mute swans and Canada geese only move short distances around the site (<200m) as they are fed in situ. Evening flightlines were observed over just one evening for tens of corvids and numerous (~2,000) gulls. The gulls do not roost at the site itself.

Further afield, along the Fleet itself, there were high counts of Brent geese (>1,600), wigeon (>1,200) as well as teal, pintail, lapwing, dunlin and Mediterranean and blackheaded gulls.

The BTO (2017) reports that although most mute swans are sedentary, in some areas they are practically or wholly migratory. Those in the UK usually just make relatively small
movements. However other birds present at the site itself and the general area, such as the wigeon and the teal, are migratory, and may have flown in from northern Europe or Ireland.

**Migratory birds at the site in Warwickshire:**

The site itself is not in one of the higher risk areas (HRA) which were previously identified on publication of the European Commission Implementing Decision 2017/263. That is because it is a recognised gull roost and these sites were deliberately not included in the HRA evidence as gulls are ubiquitous in the UK and their role in transmission to poultry as bridging species is not fully understood. However, gulls are known to have long daily flight patterns between feeding sites, such as open farmland or rubbish tips, and their night roosts such as reservoirs and gravel pits. Over the years, the numbers of gulls in areas like the Midlands have substantially increased (Banks et al., 2009) and this site has regular year-on-year counts of around 20,000 to 30,000 gulls. Some of the species of gull are known to be migratory to this site, with numbers peaking in winter, as shown in the table below for the more abundant species found at the site.

<table>
<thead>
<tr>
<th>Common name</th>
<th>Latin name</th>
<th>Peak #</th>
<th>Peak Year or month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common gull</td>
<td><em>Larus canus</em></td>
<td>10,000</td>
<td>1979</td>
</tr>
<tr>
<td>Herring gull</td>
<td><em>Larus argentus</em></td>
<td>5,000</td>
<td>1973</td>
</tr>
<tr>
<td>Lesser black-backed gull</td>
<td><em>Larus fuscus graellsi</em></td>
<td>12,000</td>
<td>1974</td>
</tr>
<tr>
<td>Black headed gull</td>
<td><em>Larus ridibundus</em></td>
<td>100,000</td>
<td>1973</td>
</tr>
<tr>
<td>Tufted duck</td>
<td><em>Aythya fuligula</em></td>
<td>2000</td>
<td>January</td>
</tr>
<tr>
<td>Pochard</td>
<td><em>Aythya farina</em></td>
<td>1255</td>
<td>January</td>
</tr>
<tr>
<td>Teal</td>
<td><em>Anas crecca</em></td>
<td>1500</td>
<td>January</td>
</tr>
<tr>
<td>Wigeon</td>
<td><em>Anas penelope</em></td>
<td>1700</td>
<td>January</td>
</tr>
</tbody>
</table>

However there are also plenty of UK resident species present at the site and we consider it likely that the migratory birds will be mixing with those resident birds, which could have come from another UK site where infection is present (and as yet undetected, if not Abbotsbury). This means it is not possible to definitively attribute the source of virus at the Warwickshire site to migrating birds. According to local ornithological expertise, the majority of Herring Gulls wintering at the site are from Scandinavia, which does not generally have high levels of avian influenza. Some gulls have been observed at the site that exhibit characteristics consistent with a Baltic origin but it is impossible to be precise about exactly where they come from. For example, Caspian Gulls (*Larus cachinnans*, a sub-species of Herring Gull which is rare at this site and the UK in general) come from the east but also breed in Germany and a bird ringed in Germany has been recorded at the site. Lesser Black-backed Gulls breeding in Europe and wintering off the coast of West Africa pass through the Leam Valley in large numbers and up to 20 or so of the subspecies *intermedius*, that does not breed in the UK, has been recorded in a single
roost at this site. A bird which showed features of the subspecies *fuscus*, the common name for which is Baltic Gull, has been very rarely observed, but it cannot be identified with certainty in the field. In summary, it is highly likely there are small numbers of gulls from east Europe (T.Marlow, Pers comm).

**Migratory birds at the site in Hertfordshire:**

The Hertfordshire site is within one of the Higher Risk Areas previously identified in winter 2017 following EU publication of the Commission Implementing Decision 2017/263 (still current), where there is a known significant migratory waterfowl population during the winter months. It is a nature reserve based on a series of gravel pits with reed beds in the Lee Valley that attract many waterfowl (such as wigeon, tufted ducks, pochards and smew) and water birds to overwinter every year. A search of social media suggest numbers of Great Black-backed and Yellow legged gulls have recently passed through this month and the gull roost can contain thousands of the more common species of gulls.

**Surrounding poultry farms:**

There have been no recent reports of disease in any poultry farms in the UK. The virus has not been fully characterised in all the poultry breeds but given the clinical signs observed in ducks in the Netherlands’ outbreak, it is likely that infection will lead to clinical signs and therefore would be reported through our disease reporting system.

**Annual and winter resident wild birds:**

There is a year round system for reporting dead and sick or injured wild birds to Defra and warden patrols take place at areas of high migratory wild waterfowl congregations. Waterfowl species tend to be the first wild birds to test positive for avian influenza in the autumn/winter. Although the presence of undetected infection in apparently healthy wild waterfowl resident in the area cannot be ruled out, the balance of probability for the source of infection lies with the migratory wild waterfowl in the area given the birds’ contact structure and the virus’s epidemiology.

The sites in Warwickshire and Hertfordshire have both resident and migratory birds and it is not possible to ascertain with any degree of certainty whether the first infected bird at either site was one or the other, or whether the source of the virus was from another area where infected birds are present (such as one of the feeding sites) or if there has been direct movement between the three sites.

**Indirect contact from unknown source to the identified sites:**

The site in Dorset is closed to visitors at this time of year, therefore there is only very limited indirect contact and introduction of contaminated products of animal origin or fomites is unlikely given the low number of outbreaks in Europe and in the absence of specific information to the contrary. The birds are fed so it is possible the feed was
contaminated from being in contact with a wild bird or by attracting wild birds to the outside feeding site.

The sites in Warwickshire and Hertfordshire however, present a different risk. Both have been open to the public over the winter and are popular bird watching sites and therefore in theory contamination could have been brought onto the sites by the public. Thus, if there were undisclosed infection in backyard poultry, infectivity could be taken on to these sites accidentally (for example on visitors’ clothing or shoes). We do not consider it likely that the source of infection is raw meat from infected poultry (either in the UK or abroad) as there have been so few cases of H5N6 in poultry in Europe and any commercial meat imported for human consumption (and not eaten) should go to ABP processing, not landfill, although catering waste may be land-filled, and could be source of infection for gulls. The large number of gulls roosting there could bring contamination from feeding sites back to the site if there was undetected infection elsewhere. However, if there were undisclosed infection in hobby or smallholding poultry, which were disposed of in the domestic waste collection, this may provide a source of infection for gulls. Therefore the level of risk of entry and uncertainty for pathways involving indirect contact from unknown sources has increased.

Local ornithological expertise has highlighted three landfill sites which are used for feeding by gulls from the reservoir: Shawell in Leicestershire, Weston-under-Wetherley in Warwickshire and Lawford Heath near Rugby; birds have been observed commuting between these sites and their roost at the reservoir. Rare sightings are also made further afield, including Birmingham, Bedfordshire, Worcestershire and even as far as York just a day after being observed at the roost (T. Marwell, pers comm). There is also evidence of a single Lesser Black-backed gull tagged in Bristol and arriving at the roost a week later, before migrating to Portugal (D. Fouracre and J. Allan, pers comm).

Conclusion for entry

As the source of infection for the three sites is highly likely to be migratory wild birds or resident wild birds from a site as yet not identified, the likelihood of finding another wild bird site in England and Wales is considered to be high. This takes account that although migratory species have mostly already arrived at their wintering sites, they will not yet leave for their breeding migration for several weeks, and mixing with other wild bird species will occur.

Exposure assessment

1. Wild waterfowl becoming infected at the site and carrying infection to poultry on poultry farms and other captive bird premises in the immediate area – medium likelihood; medium uncertainty (dependent upon on farm biosecurity)
2. Other wild water birds or wild birds becoming infected or contaminated at the site and carrying infection to poultry on poultry farms in the immediate area – medium likelihood; medium uncertainty (dependent upon on farm biosecurity)

3. Other wild water birds or wild birds becoming infected or contaminated at the site and carrying infection to poultry on poultry farms over a wider area – medium likelihood; high uncertainty (dependent upon on farm biosecurity)

4. Spread through indirect contact (fomites, products of animal origin etc) carried by gulls to poultry premises – low likelihood; medium uncertainty

5. Spread through indirect contact (fomites, clothes, shoes) carried by persons to poultry premises – low likelihood; low uncertainty

Evidence

At the Dorset site itself, there have been 23 mute swans, one Canada goose and one pochard found dead and tested positive (as of the 15th January). This would mean that the immediate environment is potentially contaminated and with low temperatures at this time of year the virus may persist for many days, even weeks.

The area around the waterfowl site in Dorset is relatively low in poultry farms but a survey of the area 10km wide along the Fleet has identified 38 premises registered on the GB poultry register, of which 21 are "commercial" in that more than 50 poultry birds are registered there, and fewer than 5 have more than 5,000 poultry.

In 2007/2008 and in 2016/2017 this site was reported with avian influenza, during periods of heightened risk across Europe. In the first instance, H5N1 HPAI was reported in 11 wild waterfowl (10 mute swans and a Canada goose) while in 2016/2017 H5N8 HPAI was detected in twenty mute swans over a period of a few weeks. During neither incident was any spread to neighbouring poultry farms observed, consistent with a low risk.

At the site in Warwickshire, the birds were reported by the warden as early as 5th January, therefore infection may have been present since the end of December, however regular patrols are not carried out at the site, and the fact that several carcasses were badly decomposed even in the recent cold weather, suggests they may have died in the last two weeks. The site is over 600 acres of water and therefore there may be (albeit patchy) large amounts of contamination.

The site is positioned along the well-established migratory flyway between the Wash and the Severn (T. Marlow, pers. comm.) therefore any birds landing there on route to westerly regions, may come in to contact with infected birds or contaminated environment.
Wild waterfowl

An ornithological survey of the area around the Dorset site in January 2017 looked at the movement of the resident ducks, geese and swans and the flight lines of other water birds, particularly gulls, in the area and observed very limited movement (<200m each day) for many of the waterfowl while the gulls tended to overfly the site itself en route to their overnight roosts. The limited daily movement of the waterfowl is likely to be linked to the local daily feeding at the site which meant minimising the need for foraging for food further afield. Local dabbling ducks such as mallards mixing with backyard poultry were a serious concern during the 2016/2017 H5N8 HPAI epizootic, therefore the risk cannot be ruled out and the uncertainty around the level of infection outside the site and along the Fleet means this is a low risk.

Wild water birds and other birds (bridging species)

There is uncertainty around the role of other bird species acting as bridging species between wild waterfowl and poultry and the level of H5N6 in the environment from infected birds along the Fleet or on the feathers, feet of other species of wild bird. Gulls are quite aggressive and particularly while feeding will often squabble and fight but it is not known if they will readily transmit HPAI H5N6 to one another. There is no information on H5N6 prevalence in other wild birds in the UK. During the European H5N8 HPAI epizootic in 2016/17 bird species other than waterfowl were testing positive, including water birds such as gulls and waders, birds of prey, corvids and passerines. Corvids and gulls were observed last year on several H5N8-infected poultry premises (IPs 1, 3, 5, 7 & 8, 11 and 12) and gulls may occasionally land at IPs too. The bridging species pathway is considered a medium risk for free-range poultry with medium confidence. Further evidence around the role of bridging species and their contact with poultry would improve the confidence. The medium risk level is related to the expectation of reasonable biosecurity on farm, and may be lower for housed poultry.

The site in Warwickshire is a known gull roost with large numbers of gulls and other water birds and waterfowl overwintering here. Gulls may fly every day many kilometres to feed at a particular site and will often be seen loafing on recently ploughed farm land. There is uncertainty over the role which gulls play as bridging species to poultry. They have been observed on poultry farm buildings, and, unlike waterfowl, they will defecate in mid-flight. However we do not have good data on the loading of virus in faeces of infected gulls. Therefore this risk pathway stays as a medium risk and the uncertainty is now high.

Indirect contact

The Dorset site is currently closed to visitors. All dead birds are being disposed of officially as animal by-products. Any official visitors to the site must wear personal protective equipment if they are handling dead birds and therefore take precautions to disinfect after the visit. This will substantially limit the likelihood of spread off the site. However the Fleet itself is a public area and may have been visited by infected wild waterfowl therefore this is a low risk with low uncertainty.
The Warwickshire and Hertfordshire sites were open to the public, therefore the possibility of fomite having been taken off the site to a poultry premises cannot be ruled out for example on visitors’ hands, clothing or shoes. The risk of this happening and poultry being infected through human fomite spread is judged to be low with low uncertainty. In addition, if an infected gull visits a reservoir where the water is directly used for supplying to poultry, this could, in theory, be another means for incursion into the farm. This risk would be negligible if the reservoir supplied mains water for use for poultry drinking water because drinking water treatment includes flocculation/filtration and chlorination which would remove the influenza viruses. Although the use of water for poultry drinking direct from ponds or reservoirs is not allowed under Prevention Order requirements, there may be some poultry holdings where this is done. Gulls could carry infectivity as fomites on their feet and feathers or as infected food scavenged from H5N6-infected wild birds at the sites to poultry. However, it would seem unlikely that a gull would drop a piece of food over a poultry premises. Indeed gulls eat food immediately to avoid its being taken by another. The chance of infectivity on the feet of gull being ingested by poultry would also be low. Therefore the risk level for this indirect contact pathway is increased but it judged to be low overall, albeit with medium uncertainty.

**Conclusion for exposure**

There is now evidence that H5N6 virus is present in three widely separated geographic locations in species which are not only migratory but also resident (indicative of local transmission) and in species which will be relatively sedentary (mallards) but also some which are highly mobile (gulls).

There is uncertainty about the role which “bridging species” such as gulls play in the transmission of AI to poultry, but previous expert ornithological assessments on premises with AI in 2016/2017 suggests gulls at the very least will commonly be found near poultry farms. The infectiousness of the H5N6 virus is expected to be similar to H5N8, based on sequence data, and therefore all poultry species will be susceptible and the biosecurity measures which were recommended last year are still applicable.

The combination of exposure pathways means the risk to poultry from exposure to wild birds in England has now increased to MEDIUM. This level can be mitigated to LOW where strong biosecurity measures are in place.

**Consequence assessment**

Further wild bird findings both locally and nationally are very likely and should not now be considered as exceptional events. Where there is good biosecurity present on poultry farms, i.e. reducing the level of direct and indirect contact between poultry and wild birds, there should be no increase in risk as a result of this finding. However the findings in gulls and waterfowl at two new sites has changed the risk question and risk level, as the behaviour of the gulls in particular, with long daily flights, attraction to agricultural land and
reservoirs (which may provide water for poultry farms) and their defecating while flying is concerning. The multiple pathways all scoring “medium” will lead to a cumulative risk score of “HIGH” for wild bird cases being found across a wider area of England and Wales. For similar reasons, the risk score for finding a poultry case has also increased, to MEDIUM, but where good biosecurity is maintained, the level remains as LOW and this also reflect the uncertainty around the nature of the virus and transmissibility in gulls.

A finding in a wild bird has no trade impact; there are no requirements for control zones or any implications for trade in live poultry, poultry products including meat and table eggs or other captive birds.

Any outbreak of avian influenza is a serious issue and the Government has good control plans in place should an outbreak occur in poultry, which will limit the spread and allow the UK to regain our disease free status as soon as possible. The trade impact would be regionalised as much as possible, in accordance with the EU regulations and third country agreements but there can still be a substantial impact from reporting a single outbreak, regardless of the size of the poultry premises.

Conclusion

Overall, the finding of wild birds infected with H5N6 HPAI virus at the site in Dorset does not substantially increase the risk of incursion to poultry on poultry farms in GB. However the new assessment suggests there is now an increase across the whole of England and Wales, because of the large number of gulls detected at these two places, their behaviour and flight patterns and the significance of one site along a migration flyway for east to west movement of waterfowl. There may be some unquantifiable increase in risk to poultry premises nearby the site in Dorset, because of the contact with bridging species or other wild water birds; this is only a marginal increase and will be time limited by the level of infection circulating in the wild bird population. This will depend on the biosecurity practices at the premises. The wider risk to poultry across England and Wales because of gull behaviour may not have changed substantially with these findings; it does reduce our level of uncertainty though and increases the geographic area known to be at risk with greater certainty. Therefore the overall likelihood of a poultry incursion occurring in the wider region has increased and is highly dependent on the level of biosecurity at the holding. There is uncertainty around whether the virus can transmit readily to gallinaceous poultry, if previous exposure of wild birds to H5N8 will change the transmission dynamics of the new strain and what the extent of the geographic bound is for the new strain. We will keep this under review.

Our previous statement on the 15th January that “there is no increase in risk of incursions of avian influenza to wild bird populations in the rest of the UK, above MEDIUM which is the current level. Wild waterfowl are unlikely to move far from the area at this time of year, according to the observed behaviour of the birds in previous seasons; this site is a high risk site during any season for avian influenza in Europe; previous incursions here did not lead to any spread to poultry farms. More wild waterfowl may test positive in the coming
weeks not only from this site but elsewhere in the UK or continental Europe and this will continue to inform our risk level" is not relevant now. More birds have tested positive and the two new sites together with the species of bird involved has changed the risk level to “HIGH” for further incursions in wild birds, meaning the event will occur often, or at least once in the next year. The exposure assessment for poultry has also increased as a result of this new finding. There is still uncertainty around the transmissibility from gulls to poultry therefore where there are no additional biosecurity measures on the holding, the likelihood of a new poultry outbreak has increased to MEDIUM. Where biosecurity is implemented well, the risk would be mitigated to LOW.

Uncertainty

An uncertainty rating is assigned to the analysis based on the following matrix. It uses a combination of the type, amount and quality of the evidence against the level of agreement between different sources.

<table>
<thead>
<tr>
<th>Uncertainty</th>
<th>Agreement</th>
<th>Evidence</th>
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</thead>
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<td>High Agreement; Medium Evidence</td>
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References


