Department
for Environment
Food & Rural Affairs

Risk assessment on the likelihood of spread of highly pathogenic avian influenza H5Nx associated with bird fairs, shows, markets, sales and other gatherings

Qualitative Risk Assessment

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Summary

The hazard is high pathogenicity avian influenza (HPAI) virus H5NX. Here, a rapid risk assessment (RRA) is undertaken to reassess the risk of HPAI H5Nx introduction from poultry and captive birds taken to bird fairs, shows, markets, sales and other gatherings (henceforth referred to as “gatherings”). The risk of other birds subsequently becoming infected at a gathering should an infected bird be introduced into that gathering and then spreading through dispersing to different establishments has been assessed in previous versions of this RRA as medium. Critical to this RRA therefore is the probability that captive birds are infected prior to their transport to a gathering together with the probability that any infected birds are not detected (and hence removed) prior to entry to the gathering.

The main route of exposure of captive birds prior to transport is through contact with wild birds (either direct contact or indirect through environmental contamination). At the present time (March 2024) the wild bird risk for HPAI H5Nx is **low** in Great Britain. This reflects the small number of HPAI H5Nx cases in wild birds in Great Britain in the last few weeks together with the start of the eastward migration of migratory ducks, geese and swans from the UK. Indeed, the last case of H5N1 in wild birds was in a herring gull in Surrey in mid-February 2024. Although there have also been four HPAI H5N5 cases in wild birds (mainly raptors) in England and two in Scotland (red kite and buzzard) in the last few weeks this does not appear to currently represent the beginning of a disease process where H5N5 spreads through wild birds. These H5N5 cases in raptors are probably just an indicator of an infection in other birds that are fed into our surveillance system either because they don’t die with infection or they are too small to be found and called in for collection. This fact doesn’t change the low risk in wild birds. Over the previous two seasons (2021 to 2022 and 2022 to 2023) we have seen unprecedented spread to seabird populations in summer, and although this cannot be ruled out entirely as a possibility in the summer months, we are seeing a much lower number of cases this season and it may be more reflective of a typical year. We will continue to monitor the situation. The last HPAI outbreak was HPAI H5N1 in poultry in Yorkshire in mid-February 2024. The risk level for poultry in Great Britain is currently (March 2024) assessed as **low**. It should be noted that the low risk level covers a broad range of risks from a quantitative perspective. Thus, the risk level for wild birds is currently up nearer the “medium end” of the low range, while the risk to poultry with stringent biosecurity is down nearer the “very low end” of low. The risk to poultry with suboptimal biosecurity ranges from the middle of the low range up to nearer the “medium end” of the low range where biosecurity is particularly poor. This is reflected in the current levels of uncertainty for the **low** risk for poultry, namely low uncertainty for stringent biosecurity but medium uncertainty where biosecurity is suboptimal. It should be noted that a few more wild bird positive cases are expected over the next few weeks. This is consistent with the definition of the low level, namely “rare but does occur”.

In terms of the bird species considered in this RRA, those poultry and bird species that are most likely to be taken to gatherings include six bird orders, namely Psittaciformes (parrots), Columbiformes (doves and fancy pigeons excluding racing pigeons), birds of prey (Accipitriformes and Falconiformes), passerines (finches), Galliformes (poultry and game birds) and Anseriformes (ducks and geese). The baseline risk of those birds being infected prior to the gathering for this RRA is based on that of poultry with sub-optimal biosecurity. As with the previous gatherings RRA, that risk for each of the six bird orders is then refined based on specific differences in access to the environment where residual infectivity from wild birds may be present.

In conclusion, the risk of introduction and spread of HPAI H5N1 into bird fairs, shows, markets, sales and other gatherings currently (at 26 March 2024) is **low** for all six of the six bird orders (namely Psittaciformes, Columbiformes, birds of prey, passerines, Galliformes, and Anseriformes (ducks and geese)). Previously the risk level was **medium** for Anseriformes (ducks and geese) due to likelihood of contact with wild waterbirds.

The uncertainty in the **low** probabilities for Galliformes and Anseriformes introducing HPAI to gatherings is **medium**. This reflects the **medium** uncertainty in the **low** risk for poultry with suboptimal biosecurity. It is noted that the level of risk in Galliformes will vary with location across Great Britain. Premises located near to waterbodies with any remaining wintering wildfowl, for example, are at the “medium end” of the low-risk band and in line with that for wild birds if the biosecurity is particularly poor. The uncertainty in the **low** probability for Psittaciformes, Columbiformes, birds of prey, and passerines introducing HPAI to gatherings is **low** reflecting that for the low risk for poultry with stringent biosecurity as many are kept indoors or in aviaries.

This RRA is based on data for March 2024. The annual wild bird migration in which overwintering ducks, geese and swans leave Great Britain and fly north and east into northern and central Europe is almost complete with many birds already having departed Great Britain. This is mirrored in the observed clearance of HPAI in wild birds and poultry from south-western Europe with no positive reports from Spain, Portugal, southern France and southern Germany recently. While HPAI positive events are ongoing in the Netherlands, Denmark and northern Germany these are of little importance for Great Britain at this time of year (late March) compared to October/November. The trajectory of HPAI H5Nx in wild birds over the next few weeks into May and June is uncertain and it is unclear whether HPAI H5Nx will over-summer as in the previous two years either in gulls and seabirds or in some other species. Thus the risk level in Great Britain, although currently **low**, may increase at some stage between now and the summer. This could be associated with an increase in the direct risk to poultry and hence to bird gatherings, particularly through Galliformes and Anseriformes.

Background

Here, a rapid risk assessment (RRA) is undertaken to reassess the risk of high pathogenicity avian influenza (HPAI) H5N1 introduction and spread from poultry and captive birds taken to bird fairs, shows, markets, sales and other gatherings (henceforth referred to as "gatherings"). Gatherings of birds involve the coming together and subsequent dissemination of live birds (as well as people, vehicles and equipment) and for this reason can facilitate the introduction and spread of avian notifiable disease including HPAI to different locations across Great Britain. The magnitude of this risk is influenced by the number of different groups of birds brought together and the likelihood of their being already infected at their point of origin. Movements out of an SZ or PZ around a confirmed infected premises are not permitted but other than this, traceability of poultry is lightly regulated so most moves outside a restriction zone are of uncertain origin and status.

Previous Defra risk assessments (Defra, 2016) were used as a basis for the general licence allowing bird gatherings to take place while minimising the risk of introduction of avian notifiable diseases to these events and mitigating the likelihood and impact of any subsequent spread. Here the risk assessment is updated to accommodate the risk levels for HPAI H5N1 in wild birds and poultry in April 2024.

Trends and risk levels in the current epizootic

After the unprecedented summers of 2022 and 2023 with HPAI H5Nx mass mortality events in seabirds and gulls respectively around the coast of Great Britain, the number of HPAI H5Nx reports in wild birds in Great Britain greatly diminished through November into December 2023. In the second half of February, there were three wild bird cases, namely a herring gull with H5N1 in Surrey and a common buzzard in Lincolnshire with H5N5 and a sparrowhawk in Greater Manchester with H5N5. There were no new wild bird cases in the first two weeks of February but one new poultry outbreak (48,000 housed chickens in Yorkshire) confirming HPAI H5N1 was still present in wild birds. In late January there was one Herring gull with H5N1 in East Sussex, but six wild bird cases in early January. These included a whooper swan with H5N1 in Norfolk, a whooper swan in Northamptonshire, two mute swans with H5N1 in Norfolk and a Canada goose with H5N1 in East Sussex. In March, there were four positive wild bird cases, all H5N5, namely a common buzzard in Lothian in Scotland, a red kite in the Highlands and a herring gull and a peregrine falcon in Northumberland. The risk level for HPAI H5Nx in wild birds in Great Britain was maintained at **medium** (occurs regularly) through January to March 2024. One criterion for reducing this risk to **low** was no new wild bird positive cases reported for four consecutive weeks. The last H5N1 case was the Herring gull in Surrey on 20 February 2024. Thus, this criterion has been met for H5N1 which has been the main strain of HPAI this season. Although there has been sporadic reports H5N5 in found-dead wild birds recently, they do not appear to represent the beginning of a disease process in British wild birds. Similarly, there have been sporadic cases of H5N5 in wild birds (geese and gulls) in northern

Germany, in addition to many H5N1 cases, and H5N5 has not taken hold there. Indeed, H5N5 appears to have been circulating at low levels in Northern Europe (Norway, Iceland) over the autumn with little indication of increasing in prevalence perhaps due to cross immunity from the previous years. On the basis of this information, the wild bird risk has been reduced to **low** in Great Britain in April 2024.

The risk to poultry in Great Britain is currently (2 April 2024) **low** and indeed has been at low for this season (i.e. since October 2023). This applies to poultry with both stringent and suboptimal biosecurity. Indeed, there has only been one outbreak of H5N1 in poultry this year, namely a housed premises with 48,000 chickens on 18 February 2024 in East Riding, Yorkshire. It was noted that this premises was near to Top Hill reservoir where many wild waterbirds overwinter. Before that, the last outbreak of H5N1 in poultry was at the end of November 2023. Where biosecurity is stringent, the uncertainty in the low risk level is considered as low. Where biosecurity was suboptimal, the uncertainty in the low risk was considered as high through December 2023. However, this uncertainty was reduced to medium in early January 2024. Given the medium risk in wild birds through January to March 2024 that uncertainty in the low risk level for poultry with suboptimal biosecurity has been maintained at medium. Even though the wild bird risk has now been reduced to low (2 April 2024) there is still uncertainty in that wild bird risk and the uncertainty in the low risk for poultry with suboptimal biosecurity is therefore maintained at medium.

It should be noted that the **low** risk level covers a broad range. Thus, the risk level for wild birds is currently up nearer the “medium end” of the low range, while the risk to poultry with stringent biosecurity is down nearer the “very low end” of low. The risk to poultry with suboptimal biosecurity ranges from somewhere in the middle of the low range up to nearer the “medium end” of the low range where biosecurity is particularly poor.

Bird orders glossary

The bird orders of captive birds considered are set out in Table 1.

Table 1 Glossary of bird orders considered here with examples.

Order	Examples
Psittaciformes	Parrots
Columbiformes	Pigeons and doves
Birds of Prey (Accipitriformes and Falconiformes)	Hawks and falcons

Passeriformes	Perching birds (Finches and canaries)
Galliformes	Turkeys, pheasants, chickens, guineafowl.
Anseriformes	Ducks and geese

Hazard identification

The hazard identified is highly pathogenic avian influenza virus, (HPAI) H5Nx.

Risk Question

1) *What is the risk of the introduction of highly pathogenic avian influenza H5Nx onto bird fairs, shows, markets, sales and other gatherings?*

2) *What, if any, management options are available to reduce the likelihood and the impact of introduction and subsequent spread of avian notifiable disease through the abovementioned gatherings?*

Scope

This qualitative risk assessment covers the risk of introduction and subsequent spread of avian notifiable disease to and from bird gatherings organised in Great Britain that were legally moved to the event from within the UK.

This risk assessment does not assess the risk related to illegal movements, negligence to report clinical disease, false certification, breaches in biosecurity etc. Any risks potentially presented by (or to) wild birds are also not assessed here.

Terminology related to the assessed level of risk

For the purpose of the risk assessment, the following terminology will apply (OIE, 2004):

- **Negligible**: So rare that it does not merit to be considered
- **Very low**: Very rare but cannot be excluded
- **Low**: Rare but does occur
- **Medium**: Occurs regularly
- **High**: Occurs very often

- **Very high**: Event occurs almost certainly

It should be noted, however, that the risk terminologies here do not represent how often an event will occur, but more indicate the probability of the event occurring.

Entry assessment

The Defra (2016) assessments concluded that the overall risk of the introduction of avian notifiable diseases including HPAI to a bird gathering is related to the ongoing disease situation in Great Britain, both in domestic poultry and in wild birds.

As adopted in previous RRAs for gatherings, the risk of those birds which may attend gatherings being infected with HPAIV H5N1 is based on the official risk of poultry with suboptimal biosecurity in Great Britain being infected through background environmental contamination from infected wild birds (see Table 2). **This risk is currently low (with medium uncertainty).** While there has been just one outbreak in poultry this year, there is uncertainty in the low wild bird risk level which has only recently (2 April 2024) been reduced from medium. This is reflected in the medium uncertainty in the low risk for poultry with suboptimal biosecurity.

Since there is no housing order currently in place in Great Britain, it is likely that most birds which may attend gatherings will have some access to the outside, often without basic biosecurity measures now. There is also no Avian Influenza Prevention Zone (AIPZ) in place which in the past years brought a mandatory biosecurity measures. For example, hobbyist fancy poultry may be allowed to roam, and pigeons, birds of prey, and even parrots may have some outside access. Those birds kept in aviaries may be at lower risk in that they cannot access ranges to which wild birds have access. However, depending on the level of biosecurity, there may be potential for direct contact with wild birds through the cage netting or indeed from wild birds perching on the aviary roofs, or indirect contact via contamination of their feed and water.

It is assumed that keepers of any birds participating at a gathering are doing so in full compliance with the legal requirements for movements of live birds, and that birds are not coming from areas under disease control restrictions.

Probability of captive bird being infected prior to being taken to gathering.

Due to the lower level of biosecurity, those birds being taken to gatherings and shows will be of more uncertain infection status than commercial poultry with stringent biosecurity. Also monitoring and data for commercial production mean that commercial birds can be tracked more easily than for those birds at gatherings and shows. Birds from non-commercial settings carry greater uncertainty. The baseline risk of infection assumed for those birds that could be taken to gatherings is based on the current (25 March 2024) risk to poultry with sub-optimal biosecurity, that is **low with medium uncertainty**. The risks for

the six bird orders considered here (Table 1) are refined in Table 2 based on specific differences in access to the environment where residual infectivity from wild birds may be present. It has already been noted above that the “low” risk band covers a wide range of risk, in fact wider than the “medium” risk level and so for bird orders such as parrots and passerines which tend to be kept in aviaries and therefore with less likelihood of contact with wild birds, the exposure level will be lower within the low band than for Galliformes and ducks and geese.

Psittaciformes and Passerines

Psittaciformes and passerines are kept in aviaries. Given the fact that HPAI H5Nx is still circulating in wild birds albeit at low levels, the risk to birds even with stringent biosecurity being exposed to HPAIV H5Nx cannot be reduced to very low because even with being kept in indoors or in aviaries, some exposure could occur given residual contamination in the environment. Therefore, the risk of captive birds being infected prior to going to the gathering is not assessed as very low even for those bird orders namely Psittaciformes and passerines which tend to be kept indoors or in aviaries and therefore with less likelihood of wild bird contact. Thus, for Psittaciformes and passerines the risk of infection prior to being taken to the gathering is still considered low in line with the official risk for poultry with stringent biosecurity. The uncertainty is low in line with that for poultry with stringent biosecurity.

Columbiformes

For the purpose of this document, racing pigeons are not included as they are considered a very different husbandry system and are the subject of an independent risk assessment. Nevertheless, related Columbiformes may taken to bird gatherings for other species or breeds. There have been relatively few reports of cases in wild Columbiformes on WOAH. Since 1 October 2022 there have been one turtle dove, four collared doves, nine rock doves, and nine wood pigeons on WOAH. There was an Inca dove in South America. In Great Britain since 1 October 2022 there have been 11 rock doves, 5 wood pigeons and 2 unidentified doves, that is 18 in total. Overall considering the abundance of Columbiformes both in Great Britain and globally, there have been relatively few HPAI H5N1 cases in pigeons and doves reported. Although Columbiformes may be kept outside, direct contact with waterbirds is likely to be low. The probability of Columbiformes being infected prior to being taken to the gathering is therefore assumed to be low with low uncertainty.

Birds of prey

There are many reports of wild raptors being infected both in Great Britain and globally with HPAI H5N1 and more recently with HPAI H5N5, perhaps because they are exposed to very high viral doses through eating infected carcases including the lungs and GI tract. Most captive birds of prey will be fed on commercial feed (such as day-old chicks, small rodents) but some are fed shot game, including wild duck. HPAI virus was detected in 4.8% of shot wild duck at sites in eastern England in autumn 2019 to spring 2020 (Wade et

al. 2023). After several deaths of captive raptors infected with H5N8 in England in 2021 through being fed frozen shot wild duck, falconers are now aware of the risk of HPAI transmission to their birds through this route. In particular they now appreciate that freezing does not inactivate the HPAI virus. Current advice is to continue to fly birds for exercise and to keep them clean but feed them on commercial feed only. The overall risk of captive birds of prey having disease prior to being taken to a gathering is considered low (low uncertainty) as reflected by the few reports of outbreaks in Great Britain this year.

Galliformes

The risk to Galliformes is the same as that for poultry with suboptimal biosecurity, namely low with high uncertainty. This is supported by the low number of outbreaks in poultry in Great Britain in the summer and autumn of 2023. The probability of Galliformes being infected prior to being taken to the gathering is therefore assumed to be low albeit with medium uncertainty.

Anseriformes

The risk level for captive Anseriformes (ducks and geese) however is decreased from **medium** to **low**, albeit with medium uncertainty (Table 2). This decrease in risk level from that in December 2023 is because although captive ducks and geese are kept outside or in un-netted ponds where they are more likely to have contact with wild waterbirds, those migratory waterbirds are now (April 2024) starting to migrate out of the Great Britain and resident waterbirds are leaving their winter aggregates to form well dispersed breeding pairs, thus reducing the risk of HPAI transmission. It should be noted that the most recent H5N1 cases in wild birds were in waterbirds and there is some uncertainty in the **low** risk level for wild birds with which captive ducks and geese could interact. For this reason, the uncertainty in the **low** risk level for captive Anseriformes is assessed to be medium.

Table 2 Probability of HPAI H5Nx infection in each group of captive birds

Order	Examples	Probability of being infected currently (2 April 2024) prior to going to gathering	Uncertainty
Psittaciformes	Parrots	[a]Low – kept in aviaries. Given some are kept indoors there is argument for reducing this risk to very low.	[a]Low
Columbiformes	Pigeons and doves	[a]Low – generally kept outside. Although	Low – based on few cases in wild

		susceptibility to H5N8 is low compared to other species (Kwon et al, 2017) infection does occur.	birds given high abundance and exposure in the environment
Birds of Prey	Hawks and falcons	[a]Low – kept in aviaries and no longer fed infected frozen shot wild duck meat as owners now well aware that freezing does not inactivate the virus. May be flown, and risk would be higher is allowed to catch wild birds, particularly ducks.	[a]Low
Passerines	Finches and canaries	[a]Low - kept in aviaries or indoors	[a]Low
Galliformes	Turkeys, pheasants, chickens, guineafowl.	[b]Low - based on current risk to poultry with poor biosecurity.	[b]Medium – likely to be outdoors with greater opportunity of exposure to wild birds
Anseriformes	Ducks and geese	[c]Low – likely to be outdoors with access to ponds where HPAI H5N1 could still be present in wild waterbirds albeit at lower levels than in December.	[c]Medium – reflects uncertainty in low risk level for wild birds
[a]Based on current risk to poultry with stringent biosecurity [b]Based on current risk to poultry with poor biosecurity. [c]Assumed that ducks and geese have greater contact with wild birds including ducks, geese and gulls			

Probability of HPAIV H5Nx not being detected prior to gathering

The level of awareness of avian notifiable diseases in Great Britain is thought to be generally high and suspicions of clinical disease in poultry and other captive birds would be reported reasonably quickly, generally within a few days. Movement restrictions for disease control purposes would be uniformly implemented based on domestic and retained EU Community legislation. The length of the virus incubation period as well as the possibility of virus shedding during this time is an important factor to be considered while assessing these risks. However, no official incubation period for avian influenzas is established for bird species other than poultry and the actual length of the incubation period is affected by numerous factors including the disease, the virus load, the actual virus strain, the species, immune status etc.

Psittaciformes

Cases of HPAI H5N1 infection in wild parrots have been reported on WOAH mainly in South America. These include blue-and-yellow macaw, budgerigar, burrowing parrot, Mealy parrot, red-and-green macaw (2), scarlet macaw, slender-billed parakeet (3), white-winged parakeet, and yellow-headed Amazon parrot. There was also an unidentified parrot at zoos in Russia and the United States and a military macaw at a zoo in Poland. The likelihood of HPAI infection being undetected for Psittaciformes is unknown, but given the multiple detections in wild parrots in South America and the cases in zoos is assumed to be low with medium uncertainty.

Columbiformes

A study in which 18 pigeons were inoculated intranasally HPAI H5N8 (clade 2.3.4.4 subgroup B) from South Africa reported viral shedding in medium and high-dose pigeons for up to eight days. Infected pigeons successfully transmitted virus to contact pigeons. There were no clinical signs observed in any of the birds involved and seroconversion was observed in two of the high-dose group chickens (Abolnik et al, 2018). Another study of domestic pigeons, inoculated oculo-nasally with HPAI H5N8 (Clade 2.3.4.4 sub-group icA3) of Korean origin, showed no clinical signs or mortality even though, relatively high levels of shedding were observed half of the pigeons. The study concluded that, though they have lower susceptibility than some other species, pigeons can be infected with HPAI H5N8 when exposed to high doses and could excrete the virus in sufficiently high doses to infect other species of birds (Kwon et al, 2017). Pigeons could also be fomite transmitters of the virus. Pigeons do not show clinical signs when infected with H5N8 (Abolnik et al, 2018, Kwon et al, 2017) and it is assumed here that there is a high probability (medium uncertainty) of not detecting Columbiformes infected with HPAI H5.

Birds of prey

The probability of disease not being detected prior to the gathering is low for birds of prey. This is because birds of prey seem particularly susceptible to morbidity and mortality from HPAI H5Nx with many affected in the wild in both Great Britain and globally. It is known that birds of prey show overt clinical signs if infected with the H5N8 HPAI virus. The infected birds of prey would show clinical signs within 2-3 days of feeding and are likely to be detected prior to taking to a gathering, hence the low risk. However, this may not be the case of all birds of prey, for example white-tailed eagle and the uncertainty is medium.

Passerines

Passerines, including canaries and finches, are known to be susceptible to LPAI H5 and that they can shed large amounts of viral RNA through the respiratory route (Marché et al 2018). While they do not show clinical signs or mortality with LPAI, if infected with HPAI H5 then mortality would be expected and there have been reports of mortality of wild passerines both globally and in Great Britain from the current HPAI H5N1 strains. This indicates that if infected with H5 HPAI mortality is likely to be expected. Since 01 October 2022, HPAI H5N1 cases include chaffinch, tree sparrow, goldfinch, house sparrow (2) and several corvids in Europe with cases in zebra finch in the Americas. For the 2022/23 season in Great Britain there has been four cases in passerines, namely a reed warbler and three carrion crows. The probability of infected passerines not being detected is therefore assumed to be low albeit with high uncertainty.

Galliformes

Galliformes show high mortality in the poultry outbreaks. Similarly, pheasants are susceptible to H5 HPAI infection and rapidly show clinical signs although those birds infected recently would still be in the incubation period. Thus the probability of infected pheasants not being detected prior to taking to a gathering would be low. However, partridges may not show clinical signs and could thus be missed. Furthermore, although Galliformes show high mortality it is considered that detection and/or reporting may be low in backyard poultry. Therefore, for the purpose of this risk assessment it is assumed the probability of disease not being detected/reported in Galliformes on backyard premises which could be taken to gatherings is medium with medium uncertainty.

Anseriformes

While there have been many dead Anseriformes-positive wild bird cases reported both in the Great Britain and globally, many wild ducks and geese have survived. Furthermore, some ducks may not show clinical signs suggesting that the probability of infected ducks and geese not being detected prior to the gathering event is high. The uncertainty is medium.

Exposure assessment

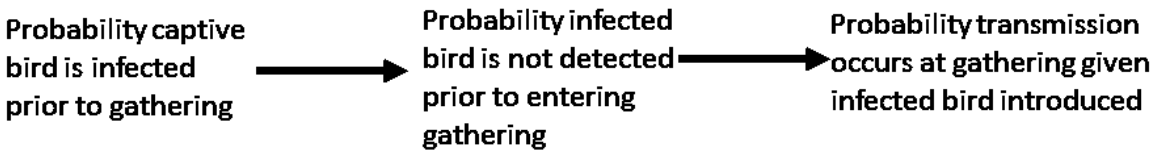
This section deals with the risk that an infected bird entering a gathering will spread disease to other birds at that gathering. If infection were to be introduced to a bird gathering, the likelihood of its spread depends on a number of factors such as the pathogenicity and transmissibility of the virus, the amount of virus being shed by the infected bird, the nature and layout of the gathering such as the housing and proximity of the participating birds, whether the birds are mixing, access to common water sources and whether they are in direct contact with visitors.

Spread of disease within the gathering

Spread through a gathering is based on the aggregated risk from multiple contacts between the infected bird introduced to the gathering and the other birds from different origins and hence going to different destinations after mixing at the gathering. From an epidemiological point of view, the probability of one or more birds actually being exposed to infection at the gathering is defined as "$1-(1-p)^n$", where p is the probability that an infected bird introduced to the gathering infects another bird given a contact, and n is the number of such contacts. There are no data on p and n at gatherings. However, even if p with low then just ten contacts with the infected bird at the gathering would be sufficient to give an aggregated probability of medium that at least one exposed bird at the gathering would be infected. If p were medium, then just one contact would be sufficient to give a medium aggregated probability that at least one bird would be exposed. Therefore, the risk of disease spread, if introduced to a gathering would be at least medium.

Qualitative risk assessment

For the purpose of this RRA a simplified risk pathway is used as set out below.



The three qualitative risks in the pathway for each bird order are combined using the matrix of Gale et al. (2009) to the give the overall risk of spread of HPAIV H5Nx from bird gatherings in Great Britain currently.

The risk assessment for the current situation (2 April 2024) is set out in Table 3.

Table 3 Qualitative risk assessment for spread of HPAI H5Nx at bird gathering according to bird group. Uncertainty in parentheses.

	Psittaciformes	Columbiformes	Birds of Prey	Passerines	Galliformes	Anseriformes
Risk of infection prior to gathering (2 April 2024) see Table 2	Low (Low)	Low (Low)	Low (Low)	Low (Low)	Low (Medium)	Low (Medium)
Probability of not being detected prior to gathering	Low (Medium)	High (Medium)	Low (Medium)	Low (High)	Medium (Medium)	High (Medium)
Risk of spread of disease at gathering	Medium	Medium	Medium	Medium	Medium	Medium
[a]Overall risk	[b]Low (low)	Low (low)	[b]Low (low)	[b]Low (Low)	Low (Medium)	Low (Medium)

[a]Overall risk of spread of HPAIV H5Nx at bird gathering calculated as lowest probability in the column according to matrix of Gale et al. (2010).

[b]Mathematically “low” x “low” equals “very low” according to Gale et al. (2014). However, given the medium/high uncertainty, the overall risk is left at “low”.

Consequence assessment

Spread of disease from the gathering

If undisclosed avian notifiable disease were to be introduced to a bird gathering by live birds, there is a possibility that unless disease is confirmed during the event, it would remain undisclosed until after the gathering – and therefore there is a potential for further spread. The likelihood of this depends on the length of the event as with longer events the possibility

that birds show signs of disease becomes greater, although it may also increase the number of potential contacts between birds at the gathering.

The extent of onward geographical spread depends on the extent of contact and spread between birds at the gathering itself and also where the birds are transported to following the event. The most effective way of preventing such spread would be to detect suspicion of disease at the time of the gathering, while the birds are still together. However, if the source of infection is a (group of) birds with subclinical infection, this increases the risk of onward spread. The size of the gathering, levels of biosecurity and length of the gathering would directly affect the number of potential contacts between infected and susceptible birds.

The consequence of avian influenza being detected in birds either at or having attended a gathering during the risk period is a serious matter for not only industry but also for the competent authorities. This could lead to a multi-focal outbreak in birds which have moved to different parts of the country and which are difficult to trace.

Any outbreak of notifiable avian disease has a significant impact on the UK poultry industry, through the trade and economic impacts on the producer. This is the same for any notifiable avian influenza virus. Average costs to government may be between £2 million and £4 million per outbreak, depending on the number of birds involved and complexity of the investigation.

If disease is detected at a gathering before it concludes and before the birds are dispersed, Government would face a complex challenge relating to disease control at the gathering, including dealing with a large number of owners who may be resistant to the need to cull their birds.

Whilst spread from a gathering may not lead to widespread disease into the commercial sector and may be restricted to small producers, the case in 2007 in the UK involving a market showed that there is a potential scenario for this occurrence. While for the majority of shows and gatherings involve birds classified as not destined for the food chain (as breeders or producers) it is important to note that even one outbreak in backyard premises would still lead to implementing disease control measures, as specified in the current regulations.

The risk assessment presented here addresses the risk of transmission at gatherings and does not consider how many other establishments could be infected, which would depend on the size of the gathering and individual bird keepers who attend them. In the 2020 to 2021 epizootic of HPAIV H5Nx in Europe, there was evidence that many captive bird/poultry outbreaks could be traced to a single dealer in southern Germany emphasizing the potential consequence that gatherings could have.

A reasonable worst-case outcome for multiple outbreaks to occur would be for an infected but apparently healthy bird to be taken to a gathering where it infects some, but not all, of the other birds present, but disease is not detected. The birds at the gathering are then

taken to widely distributed premises. One or more of the infected birds is then detected through passive surveillance leading to at least one outbreak being confirmed with consequent disease control zones, impacts on industry and a costly tracing exercise. There has been one comparable case in recent years but this involved LPAI so the consequences were limited and again, for certain species of birds this is less likely.

Mitigation measures

Measures to mitigate the risk of disease entering a gathering and the potential impact include disease vigilance and prompt reporting of any suspicion, high levels of biosecurity and accurate record keeping to assist in any possible tracing exercise following the event. A table is provided below of possible measures. The risk of further (cross) contamination and onward spread occurring at and beyond the gathering could be mitigated by maintaining high levels of biosecurity, including reducing the number of potential contacts between infected and susceptible birds and informing livestock keepers about the need for vigilance for clinical signs of avian notifiable disease. A quarantine/standstill period on holdings after return of birds from gatherings could also be considered, although may be impractical, particularly for backyard premises.

Conclusions

Currently (2 April 2024) the risk from gatherings is predicted to be **low** for all captive bird groups including Psittaciformes, Columbiformes, passerines, birds of prey, Galliformes, and Anseriformes (ducks and geese). Due to the medium uncertainty in the low risk level for the presence of infection in poultry prior to attending the gathering (based on the current risk level for poultry with suboptimal biosecurity), the uncertainty in this low risk level for Galliformes attending gatherings is also medium. It should be noted that the “low” risk band covers a wide range of risk and so for bird orders such as Psittaciformes, birds of prey and passerines which tend to be kept in aviaries and therefore with less likelihood of contact with wild birds, the risk level will be lower within the low band than for Galliformes. Also, the low probabilities that infected birds of prey and passerines are not detected prior to the gathering would reduce their risks further. The uncertainty in the low risk levels for Psittaciformes, Columbiformes, passerines, and birds of prey is low as many are kept indoors or aviaries. Although Anseriformes (ducks and geese) have greater contact with wild waterbirds than other captive bird groups, the risk level in those wild waterbirds has decreased from **medium** to **low** since our last risk assessment for gatherings in December 2023, with many migratory waterbirds now departing Great Britain. The risk from Anseriformes at gatherings, is therefore now assessed as **low** although depending on their degree of contact with wild waterbirds the actual risk level may be nearer the “medium end” of the low risk level. The uncertainty in the **low** risk level for Anseriformes is therefore **medium**.

Therefore in response to the risk questions:

1) What is the risk of the introduction of HPAI H5Nx into bird fairs, shows, markets, sales and other gatherings? **The risk currently (at 2 April 2024) is low for all species including Anseriformes (ducks and geese).**

2) What, if any, management options are available to reduce the likelihood and the impact of introduction and subsequent spread of avian notifiable disease through the above mentioned gatherings? **Options are to ban, allow only certain species or allow everything with stricter controls and this is in order of increasing risk. A regionalisation option could also be considered.**

Uncertainties

It is noted that the actual level of risk in Galliformes and Anseriformes will vary with location across Great Britain. Premises located near to waterbodies such as estuaries and lakes with any remaining wildfowl, for example, may be remain at the medium end of the low risk band over the next few week particularly if the biosecurity is particularly poor.

It should be noted that both HPAI H5N1 and HPAI H5N5 are still circulating in wild birds in Great Britain albeit at low levels. It is not known yet how, or if, the trajectory will change over the next few weeks. Reassuringly, HPAI is starting to clear from the south-west of Europe with no more cases in southern Germany, southern France, or the Iberian Peninsula in the last few weeks, perhaps reflecting the start of the wild bird migration eastwards. However, in the last two summers HPAI has been maintained in seabirds and gulls in both Great Britain and western Europe over the summer into the autumn when the migratory wild waterbirds return. Thus, although the wild bird risk is continuing to fall currently in Great Britain and has been reduced to **low** (2 April 2024) this could change in the summer months. In terms of wild bird movements, the situation in other parts of the world such as the USA and Asia is not relevant to Great Britain at this time of year.

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