Risk assessment:

avian influenza

in public parks / parkland

&

open waters

due to

wild bird exposure

9th July 2006

Background

Avian influenza is a disease of birds caused by influenza viruses closely related to human influenza viruses.

Avian influenza often causes little or no disease in wild waterfowl but sometimes causes large outbreaks in poultry.

Avian influenza viruses are classified as being of 'low pathogenic avian influenza' (LPAI) or 'highly pathogenic avian influenza' (HPAI) types depending on the potential for these viruses to kill domestic poultry. These terms do not refer to how serious the viruses may be to humans.

Highly pathogenic avian influenza (HPAI) was first recognized in poultry in Italy in 1878, it is extremely contagious between poultry and rapidly fatal, with the mortality rate in poultry frequently approaching 100%. Birds can die on the same day that symptoms first appear.

Low pathogenic avian influenza (LPAI) virus infection in poultry results in milder, less significant disease.

Humans infection, with either high or low pathogenic avian influenza viruses occurs rarely. Human cases were described in Hong Kong in 1997 during the large outbreak of avian influenza affecting the large live poultry markets; again in Hong Kong in 1999; in The Netherlands in 2003 and in British Columbia in 2004. If humans become infected, they are usually infected through close contact with live infected birds. Birds shed influenza virus in their faeces so contact with faeces (for example by visiting enclosed areas where birds are or have been recently been kept) is a possible transmission route.

In the current outbreak (2003 - 2006) of highly pathogenic avian influenza due to the H5N1 strain of influenza virus, although millions of chickens and ducks have become infected only 229 human cases have been reported. These human cases have occurred in a number of countries (Azerbaijan, Cambodia, China, Djibouti, Egypt, Indonesia, Iraq, Thailand, Turkey, & Viet Nam)[1]. There have been occurrences of highly pathogenic avian influenza due to the H5N1 strain of influenza virus being identified in wild birds in some countries in Europe but there have been no associated human cases.

Avian influenza in the UK

There have been two incidents involving the detection of avian influenza viruses in birds in the UK during the first 5 months of 2006:

On the 30th March 2006 a dead swan, found on the coast in Cellardyke, Fife, Scotland, was tested for avian influenza viruses as part of Defra's surveillance programme for Great Britain. A highly pathogenic avian influenza virus of type

[1] Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO. Accessed 9th July 2006 at:
http://www.who.int/csr/disease/avian_influenza/country/cases_table_2006_07_04/en/index.html

H5N1 was detected. The swan (originally identified as a Mute Swan) was subsequently identified as a Whooper Swan.

The Defra preliminary risk assessment[2] prepared after this event comments that '…this event was not unexpected as our previous risk assessments have considered that the virus may be detected in the UK at some point in the future …' and that '… many uncertainties still remain with regard to the geographic distribution of the virus in Asia, Europe, Africa and beyond and further developments are likely. Our previous risk assessments have considered that the virus may be detected in the UK at some point in the future. While many uncertainties remain with regard to species susceptibility and the ecology of the virus, intensified surveillance of wild and domestic birds in the UK suggests that this event was possibly a recent point introduction of the virus …'.

On the 26th April 2006 evidence of a low pathogenic avian influenza virus of type H7N3 was found in a broiler breeder flock in Dereham, Norfolk. Evidence of H7N3 LPAI virus infection was subsequently found on two additional poultry farms, approximately 3km from the first detected farm, and under the same ownership. One case of mild conjunctivitis (eye infection) was identified in a poultry worker associated with this outbreak. No cases of person to person spread of this infection and no other cases of animal to human infection were identified in this incident[3].

Issues

The purpose of this risk assessment briefing is to describe the qualitative risk from avian influenza in the UK to park workers, and members of the public visiting public parks, including areas designated for water sports / water based leisure activities, especially where waterfowl are present, given:

- the current knowledge of the distribution of avian influenza viruses in Europe and the UK;
- the science knowledge base of exposure pathways that may present a risk to humans;
- the known epidemiology of the zoonotic potential of this disease on the basis of the global reporting of disease cases during recent years;
- The existing data on environmental survival of avian influenza viruses.

[2] Defra, (2006). HPAI H5N1 in a Mute Swan (Cygnus olor) in Scotland. (Authors: Sabirovic, M., Wilesmith, J.,Landeg, F.), International Animal Health Division, 1A Page Street, London, SW1P 4PQ, United Kingdom. Version 1, Released 7 April 2006, pp. 6

[3] Nguyen-Van-Tam J S, Nair P, Acheson P, Baker A, Barker M, Bracebridge S, Croft J, Ellis J, Gelletlie R, Gent N, Ibbotson S, Joseph CA, Mahgoub H, Monk P, Reghitt T W, Sundkvist T, Sellwood C, Simpson John, Smith J, Watson J M, Zambon M, Lightfoot N, Outbreak of low pathogenicity H7N3 avian influenza in UK, including associated case of human conjunctivitis. Euro Surveill 2006;11(5):E060504.2. Available from: http://www.eurosurveillance.org/ew/2006/060504.asp#2

Risk assessment

Science: Many, if not most, species of birds are thought to be susceptible to avian influenza virus infection. Of importance to public parks and open waters the susceptible species include all varieties of ducks and geese.

The main mechanism by which ducks and geese will shed virus that could infect humans is by faecal excretion. Viruses in respiratory secretions are minimal, and the possibility of blood and raw meat consumption from a park animal can be discounted.

To give rise to illness in humans infected faecal materials from a bird containing a large enough concentration of live viral particles would have to enter the respiratory or gastro-intestinal tract, or pass through thin membranes (such as the eye), of a human. For an infective dose to be established the faeces must either be consumed, or faecal dusts inhaled / ingested, or such dusts allowed to enter the eye in sufficient quantities.

Bird faeces falling to the ground in a park are usually semi-liquid. This binds the viral particles within the droppings and they are at this stage not hazardous unless they are allowed to contaminate hands or foodstuffs. The number of viable virus particles in these faeces will rapidly start to fall under the effects of drying, UV light and other environmental factors. In the absence of a suitable animal host the viruses cannot reproduce, and, together with drying and / or rain and park cleaning, the virus will be further diluted and dispersed.

Direct contact with dried faecal material is not likely to be hazardous as the numbers of live viral particles contained will have dropped substantially (drying of the virus helps to kill it). Inhalation, ingestion and eye contamination risks could still theoretically occur as small particles of the drying faecal matrix breaks away and is blown up into the air, entering peoples mouths and eyes. However, because of the massive dilution of such particles in the outdoor environment it is unlikely that this theoretical mechanism of infection will present any risk to humans. Aerosols of dried bird faeces are only likely to present a hazard in large scale indoor poultry flock premises where the close containment of the building and the very large quantities of poultry faeces present may create a risk.

Bird faeces entering the water of ponds, lakes, reservoirs or outdoor swimming pools could theoretically create a risk to humans using these waters for sport or other recreational pursuits. Such infection could arise because of ingestion of contaminated water; inhalation of aerosols of contaminated water; or by contaminated water entering the eye. Avian influenza viruses contained in bird faeces entering recreational waters will become dispersed and environmental factors will cause avian influenza viruses in such surface waters to be slowly deactivated. This process of deactivation is slowest in cold waters (4°C-10°C). The dispersal effect is the most important in reducing risk to humans in the case of surface water contamination. The very significant reduction in risk to humans in contact with

these waters because of dispersal is most marked where the volume of the water compared to its surface area is high (lakes, reservoirs and outdoor swimming pools), or the water is being rapidly replenished (such as in fast flowing streams and rivers). A higher degree of risk may be present where a small volume of stagnant water is heavily contaminated with bird faeces[4].

Epidemiology: Several strains of avian influenza virus have given rise to human disease in recent years. The most significant are the current strains of avian influenza H5N1 circulating in the bird population. These strains of avian influenza virus are poorly adapted to humans, and, despite very frequent exposure of humans to these viruses, very few clinical cases have arisen globally.

Virtually all cases of H5N1 infection reported are associated with close living between humans and poultry, where continuous exposure to high concentrations of faecal materials have occurred. Other exposure pathways have included slaughter, defeathering, butchering, and preparation of infected birds in advanced stages of illness in family kitchens.

No case has yet been reported of illness due to contact with birds infected with high pathogenicity H5N1 avian influenza viruses in the following groups:

- catchers, cullers and persons involved in disposing of infected flocks (whether or not they were wearing appropriate protective equipment);
- persons involved in survey work collecting dead birds;
- persons involved in survey work undertaking capture of live birds, ringing, or taking faecal specimens;
- visitors to parks and zoos;
- visitors to public farms;
- park keepers and groundsmen of any kind;
- animal / bird keepers at zoos and parks;
- persons collecting and processing refuse (including birds that have died of avian influenza H5N1);
- veterinarians;
- workers at animal refuges.

The other strains of avian influenza virus, which have given rise to human infection in Europe in the last decade are H7N7 (highly pathogenic avian influenza, Holland, 2003) and H7N3 (low pathogenic avian influenza, England, 2006).

Transmission of high pathogenicity H7N7 virus to catchers, cullers and persons involved in disposing of infected flocks and veterinarians has been

[4] This advice is consistent with the views of the European Centre for Disease Prevention and Control (ECDC) experts group, whose opinions are summarised in 'Negligible risk of H5N1 infection from bathing and drinking water in Europe: ECDC risk assessment'. Euro Surveill 2006;11(6):E060608.4. Available from: *http://www.eurosurveillance.org/ew/2006/060608.asp#4*

reported in one incident in Holland[5]. This is not a strain of avian influenza virus known to be currently circulating in either wild or domestic birds in the UK or Europe.

One case of transmission of H7N3 infection resulting in a mild case of conjunctivitis (eye infection) has been reported from a recent outbreak in farmed poultry in the UK (as referred to above in the section on avian influenza in the UK). There is no evidence that this strain of avian influenza is currently circulating in wild birds in the UK.

Summary: Within our current understanding of the science and epidemiology of avian influenza (and with particular reference to the H5N1 strain) the principal means of introducing avian influenza viruses to a public park / parkland or recreational waters would be via the faeces of an infected bird.

In respect of access to parks and parklands; If direct contact with fresh bird faecal material is avoided, or any contamination promptly washed from hands or other parts of the body (soap and water only, no disinfectants / viricides are required), then there should be no ingestion risk. Barring the direct consumption of significant quantities of fresh bird faeces, then the mechanisms of environmental degradation and dilution and dispersal, will ensure that there is no pragmatic means for infection of humans visiting or working in open environments in parks / on parklands to occur. These view are consistent with the reported epidemiology that no human cases have arisen in or around animal parks, or in persons undertaking the range of jobs required to service such parks.

In respect of access to recreational waters; the mechanisms of dilution and dispersal will ensure that persons pursuing or supporting sports or leisure activities associated with lakes, reservoirs, outdoor swimming pools, or rapidly flowing rivers or stream are not at increased risk of becoming infected with an avian influenza virus. However, where there is clear evidence of heavy faecal contamination in small volume of waters (especially if stagnant), then sensible local discretion should be exercised in preventing access or use of such waters should avian influenza viruses be known to be circulating in wildfowl in the area.

Current advice on handling dead birds

Defra, the Department of Health and the Health Protection Agency have already considered issues concerning the management of dead birds, regardless of whether there is any avian influenza in the UK.

Birds not needed for surveillance purposes can be disposed of safely through normal refuse collection services or by local burial. Birds that die in

[5] M Du Ry van Beest Holle, A Meijer, M Koopmans, CM de Jager, EEHM van de Kamp, B Wilbrink, MAE Conyn-van Spaendonck, A Bosman Human-to-human transmission of avian influenza A/H7N7, The Netherlands, 2003. Euro Surveill 2005;10(12):264-8. Available from: http://www.eurosurveillance.org/em/v10n12/1012-222.asp

circumstances that are unusual will be collected by Defra and submitted for examination to its virology laboratory.

Defra advice on this matter to the public includes notes on when and when not to report a bird die-off, details of how to dispose of birds not required for surveillance purposes and the personal hygiene measures to be observed when disposing of dead birds. This advice is reproduced in an appendix to this text.

Recommendations

Until and unless there is a significant change in the science or epidemiology of this disease it is recommended that:

1. There is no excess risk to members of the public and park keeping staff from the presence of wild birds in parks in England;

2. There should be no restrictions on park visiting;

3. Persons pursuing or supporting sports or leisure activities associated with lakes, reservoirs, outdoor swimming pools, or rapidly flowing rivers or stream are not at increased risk of becoming infected with an avian influenza virus;

4. There should be no restrictions on the use of lakes, reservoirs, outdoor swimming pools, or rapidly flowing rivers or stream for established recreational uses except where there is clear evidence of heavy faecal contamination in relatively small volume waters (especially if stagnant), where sensible local discretion should be exercised in preventing access or use of such waters should avian influenza viruses be known to be circulating in wildfowl in the area;

5. The current Defra guidelines on reporting bird die-offs and their guidelines on disposal of dead birds not required for surveillance purposes is fit and appropriate whether, or not, avian influenza is present in the bird population of the UK;

6. There is no reason, based upon the review of the science and epidemiology given above to vary this advice for the particular circumstances of parks and park keeping staff or persons involved in servicing open water recreational activities;

7. It is sensible to anticipate public concern should avian influenza become present in parkland birds. Advanced preparation of public handling documents would help to respond to this situation should it arise;

8. In order to ensure that there is consistency of action across the country an advisory note to public park keepers / local authorities should be prepared summarising the advice given in this risk assessment document.

Appendix 1: scenarios / notes on handling incidents

In order to test the assertion of this assessment that there is no excess risk in the public use of parks, parklands or recreational waters the following advice for four potentially foreseeable scenarios is set out below:

Where reference is made to avian influenza this should be taken to mean only avian influenza viruses known to have the capability of causing significant disease in man, such as the current H5N1 strain.

- The status quo: that is avian influenza has been identified in a single wild bird in the UK;
- Avian influenza entering the indigenous species of parkland birds (especially wildfowl) in the UK;
- A local die-off of birds suspected to be due to avian influenza;
- A local die-off of birds confirmed to be due to avian influenza.

Status Quo: Contact with avian influenza viruses is not likely given that there is no suspicion that infected birds are visiting parks. The parks should be open without restriction. Signposting of public toilets (providing soap and running water) is sufficient to ensure that the public has access to appropriate hygiene facilities for hand washing. Dead birds should be dealt with under the Defra guidance. Hard standing areas where birds habitually defecate (for example places where the public often hand feed birds) should be regularly cleaned to reduce the risk of contamination of the hands of the members of the public. Daily cleaning should be sufficient; it is not necessary to use disinfectants or viricides, mechanical sweeping and / or plain water wash down is sufficient.

There should be no restrictions on the use of lakes, reservoirs, outdoor swimming pools, or rapidly flowing rivers or stream for established recreational uses.

Avian influenza entering the indigenous species of parkland birds (especially wildfowl) in the UK: Even though it is foreseeable that infected birds may be present in a public park, the analysis of the pathways of infection to humans suggest that there is no excess risk present. Therefore, as in the status quo scenario, parks should be open without restriction. Dead birds should be dealt with under the Defra guidance. Hard standing areas where birds habitually defecate (for example places where the public often hand feed birds) should be regularly cleaned to reduce the risk of contamination of the hands of the members of the public. Daily cleaning should be sufficient; it is not necessary to use disinfectants or viricides, mechanical sweeping and / or plain water wash down is sufficient. Regular inspections to identify dead birds may be undertaken for public reassurance purposes and to ensure that birds not required for surveillance purposes are promptly removed and disposed in accordance with the standing Defra guidance.

There should be no restrictions on the use of lakes, reservoirs, outdoor swimming pools, or rapidly flowing rivers or stream for established

recreational uses except where there is clear evidence of heavy faecal contamination in relatively small volume waters (especially if stagnant), where sensible local discretion should be exercised in preventing access or use of such waters should avian influenza viruses be known to be circulating in wildfowl in the area. Where such restrictions are being considered the advice of the local Health Protection Agency unit should be sought.

A local die-off of park birds suspected to be due to avian influenza: Suspicion of such an event should be based upon Defra guidelines. Should it occur within a park / on parkland the public should be prevented from handling the dead birds and arrangements made for Defra to collect these birds. As per the risk assessment no excess risk will be present to the public who witnessed the die-off. The public need only be kept temporarily out of the immediate area where the die-off occurred. The park should otherwise remain open. Cleaning of any hard standing areas where birds were found should be undertaken to reduce the risk of contamination of the hands of the members of the public. Mechanical sweeping and / or plain water wash down is sufficient. The public can be re-admitted to this area after the birds are removed and cleaning of hard standing areas undertaken.

Hard standing areas where birds habitually defecate (for example places where the public often hand feed birds) should be regularly cleaned to reduce the risk of contamination of the hands of the members of the public. Daily cleaning should be sufficient; it is not necessary to use disinfectants or viricides, mechanical sweeping and / or plain water wash down is sufficient. Regular inspections to identify dead birds may be undertaken for public reassurance purposes and to ensure that birds not required for surveillance purposes are promptly removed and disposed in accordance with the standing Defra guidance.

There should be no restrictions on the use of lakes, reservoirs, outdoor swimming pools, or rapidly flowing rivers or stream for established recreational uses except where there is clear evidence of heavy faecal contamination in relatively small volume waters (especially if stagnant), where sensible local discretion should be exercised in preventing access or use of such waters. Where such restrictions are being considered the advice of the local Health Protection Agency unit should be sought.

A local die-off of park birds confirmed to be due to avian influenza: If all actions detailed in the case of die-off suspected to be due to avian influenza have already been undertaken there is no residual hazard. Therefore, as in the status quo scenario parks should be open without restriction. Dead birds should be dealt with under the Defra guidance. Hard standing areas where birds habitually defecate (for example places where the public often hand feed birds) should be regularly cleaned to reduce the risk of contamination of the hands of the members of the public. Daily cleaning should be sufficient; it is not necessary to use disinfectants or viricides, mechanical sweeping and / or plain water wash down is sufficient. Regular inspections to identify dead birds may be undertaken for public reassurance purposes and to ensure that birds

not required for surveillance purposes are promptly removed and disposed in accordance with the standing Defra guidance.

There should be no restrictions on the use of lakes, reservoirs, outdoor swimming pools, or rapidly flowing rivers or stream for established recreational uses except where there is clear evidence of heavy faecal contamination in relatively small volume waters (especially if stagnant), where sensible local discretion should be exercised in preventing access or use of such waters. Where such restrictions are being considered the advice of the local Health Protection Agency unit should be sought.

Appendix 2: Defra Guidance on handling and disposing of dead garden and wild birds[6]

The advice given here applies in all circumstances where members of the public may come across a dead bird, regardless of whether there is any avian influenza in the UK.

Over the summer months collection priorities have been revised to take into account the lower risk presented by migratory birds. If you find die offs involving 3 or more dead birds of the same species or 5 or more dead birds from different species in the same place you should contact the **Defra Helpline (08459 33 55 77)** and choose the Avian Influenza option which will be open from 9am - 5pm, Monday - Friday.

Single dead birds do not require referral or collection. If the dead bird is a single, small garden, or wild bird then you do not need to call Defra. You should:

- *leave it alone, or*
- *follow the guidelines below for disposal*

Wild birds can carry several diseases that are infectious to people and some simple hygiene precautions should minimise the risk of infection. It is hard for people to catch avian influenza from birds and the following simple steps are also effective against avian influenza.

If you have to move a dead bird

1. *Avoid touching the bird with your bare hands*
2. *If possible, wear disposable protective gloves when picking up and handling (if disposable gloves are not available see 7)*
3. *Place the dead bird in a suitable plastic bag, preferably leak proof. Care should be taken not to contaminate the outside of the bag*
4. *Tie the bag and place it in a second plastic bag*
5. *Remove gloves by turning them inside out and then place them in the second plastic bag. Tie the bag and dispose of in the normal household refuse bin.*
6. *Hands should then be washed thoroughly with soap and water*
7. *If disposable gloves are not available, a plastic bag can be used as a make-shift glove. When the dead bird has been picked up, the bag can be turned back on itself and tied. It should then be placed in a second plastic bag, tied and disposed of in the normal household waste*
8. *Alternatively, the dead bird can be buried, but not in a plastic bag*
9. *Any clothing that has been in contact with the dead bird should be washed using ordinary washing detergent at the temperature normally used for washing the clothing.*
10. *Any contaminated indoor surfaces should be thoroughly cleaned with normal household cleaner.*

Defra guidance on handling and disposing of dead garden and wild birds will change from time to time. For the most up to date advice please always check the Defra website.

[6] Page last modified:June 29th 2006. The latest information is available from: *http://www.defra.gov.uk/animalh/diseases/notifiable/disease/ai/wildbirds/index.htm#reporting*