EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

TECHNICAL REPORT

ECDC GUIDELINES

Minimise the Risk of Humans Acquiring Highly Pathogenic Avian Influenza from Exposure to Infected Birds or Animals Version December 21th 2005

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ECDC guidelines to minimise the risk of humans acquiring highly pathogenic avian influenza from exposure to infected birds or animals

Summary

The risk for any one person working with infected birds is low, though it seems to vary according to the exact type of highly pathogenic avian influenza (HPAI). HPAI transmission is by direct contact with infected birds or bird products.

Protection is based on the application of the following eight principles:

1. Control infection in birds.
2. Minimise the number of people possibly exposed to the virus – as far as possible separating people from the avian viruses and potentially infected birds and animals.
3. Technical measures
4. Organisational measures
5. Proper use of personal protective equipment and adoption of technical and organisational measures for those directly involved in the work with potentially infected animals.
6. Proper but controlled limited use of antiviral drugs.
7. Considering seasonal influenza vaccination, especially if seasonal influenza is circulating.
8. Careful surveillance for infection among those potentially exposed.

Each preventive measure should follow a local risk assessment.

Risks for people working with infected birds

The risk of acquiring infection for any one person working with infected birds is low, although it seems to vary according to the exact type of highly pathogenic avian influenza (HPAI). For the most dangerous HPAI, A/H5N1, the infection risk seems to be very low. Although there have recently been huge epidemics of A/H5N1 in birds in

southeast Asia there have been surprisingly few human infections, and very few among those engaged in culling (killing) of birds.[1,2] Infection protection for workers employed in culling of large chicken flocks in Thailand and Vietnam flocks has often been poor, but no illness due to A/H5N1 has been noted in the many workers involved. Even if there may be sub-clinical cases in humans, present evidence indicates that this should be very rare and that infection with A/H5N1 is generally so severe that it would not be missed.

EU legislation on occupational health and safety

There already exist EU directives for occupational health and safety that contain general principles/measures concerning the prevention of occupational risks and the protection of the workers' safety and health [§]. The full and accurate practical implementation of the national legislation transposing the Community directives on health and safety at work is essential to ensure an appropriate protection of workers. The specific obligations of employers (such as risk avoidance, risk assessment, prevention and protection measures, training, information and workers' consultation) are clearly specified in the above Community legislation. In particular, Directive 2000/54 on the protection of workers against the risks arising from exposure to biological agents contains more specific provisions on information and notification to the competent authority (Articles 7 and 13), hygiene and individual protection (Art. 8), information and training of workers (Articles 9 and 10), list of exposed workers (Art. 11) and health surveillance (Art 14), as well as special measures for industrial processes, laboratories and animal rooms (Article 16). Strict adherence to the provisions of directive 2000/54/EC shall be closely monitored by Member States.

All prevention measures have to follow a local risk assessment. The employer is responsible for this assessment and for establishing the protective and preventive measures. EU directive 1989/391 states that collective protective measures have priority over individual ones.

[§] EU Council Directives: 89/391/EEC (on the introduction of measures to encourage improvements in the safety and health of workers at work), 89/686/EEC (on the approximation of the laws of the Member States relating to personal protective equipment), 89/656/EEC (on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace), 2000/054/EC (on the protection of workers from risks related to exposure to biological agents at work, seventh individual directive within the meaning of Article 16(1) of Directive 1989/391)

Examples of activities with possible direct contact with infected birds and contaminated materials

- Activities in poultry farming with infected birds
- Veterinary examination and post-mortem examination
- Culling of poultry including activities in mobile culling and disposal units
- Carcass disposal facilities
- Cleaning and disinfection of contaminated areas
- Sampling
- Activities in diagnostic laboratories
- Other activities where humans are exposed to a confirmed infection in a bird or animal (quarantine staff, owners of small domestic flocks, etc.)

Following a local risk assessment, it may be prudent to include people living close to an infected farm among those potentially exposed to the virus.

Mode of Transmission

When birds are infected by HPAI they shed large amounts of virus with their faeces and also when coughing and sneezing (although some evidence suggests that respiratory spread plays a lesser role for A/H5N1). Viruses are usually not very stable outside a living cell, however in particles of dust or faeces they can survive for days – or even weeks – depending on strain and ambient factors. HPAI causes primarily conjunctivitis and respiratory disease in humans though more severe disease may follow. Conjunctivae and upper respiratory tract mucosa are therefore the most likely entry routes for AI viruses. Humans usually get infected by HPAI when having close contact to live infected birds, their faeces or other bird body fluids and secretions. Also contact with contaminated surfaces of cages, shed equipment or places where infected birds have been kept and contact with infected dead birds can lead to infections of humans, for example when eyes or nose are rubbed, or feathers get behind goggles.

When handling diseased birds for the purpose of culling wing-flapping and other bird movements and human activities that cause development of dust could increase the risk of transmission.

Handling uncooked meat and blood of infected birds might pose a risk when again these get in contact with eyes or nose. Cooking poultry meat inactivates/kills the virus and renders the meat fully safe.

The Principles of Protection

Guidance has already been developed by WHO – Western Pacific Region and a number of individual European countries and this guidance draws on that. Until now there has been no specifically European Guidance.[2-4]

Protection of workers against occupational infection rests on following principles:

1. Control infection in birds quickly and safely

- This is straightforward. The less infection in birds and the quicker they are controlled then the fewer people will be exposed and infected.
- People may mechanically spread infection from one bird flock to another by contaminated hands, shoes or clothes. Conversely, adherence to the appropriate precautions plays an important role in controlling infection. Outbreaks of avian influenza in poultry are subject to stringent control measures laid down in EU legislation[§].

2. Minimise those exposed – separating people from animal infections

- The minimum number of people necessary should be involved in bird culling.
- Farm workers or owners who are not directly involved in culling activities should avoid exposure to known or potential sources of avian influenza virus (i.e. avoiding contact with chickens, ducks and other poultry unless absolutely necessary).
- Other people living on the farm (e.g. family members) should also avoid exposure to known or potential sources of avian influenza virus.
- It may be a good idea to restrict local movement of people into and out of the affected area both to reduce the number of people exposed and to lower the risk of extansion of infection among animals.

[§] Council Directive 92/40/EEC on Community measures to control avian influenza.

- Cleaning and disposal of laundry and disposal of waste should be safe at all stages until the infection risk has been eliminated.

3. Technical measures

When handling birds or contaminated materials (e.g. body parts, tissue, blood, feathers and excretions, including used beddings) attention must be paid to avoiding or minimising the formation of dust or other aerosols. Possible measures are:

- culling the birds by either flooding the animal housing with CO_2 or according to EFSA recommendation by placing the animals in suitable containers including effectively restricted areas of a building, containing inert gas mixtures such as Argon with not more than 2% oxygen[5]. See also Council Directive 93/119/EC
- moistening the dead birds with fine water mist
- moistening the surfaces for cleaning
- mechanising the carcass collection and disposal
- transporting the dead birds and contaminated materials in tightly closed containers.

4. Organisational measures

All workers in contact with potentially infected birds and materials should be given information and specific training about HPAI infection in humans, its symptoms and the specific preventive and protective measures to be adopted.

All workers should have access to appropriate personal protective equipment (PPE) and should receive instruction and training in PPE use.

5. Use of Personal Protective Equipment (PPE) for those directly involved in the work

The employer has to provide the following required PPE:

- Impermeable disposable gloves or heavy duty rubber work gloves that can be disinfected should be worn.
- Gloves must be removed promptly after use and safely disposed of, before touching non-contaminated items and environmental surfaces.

- A respiratory protective device (RPD) of at least filter class P2, individually fitted. A power assisted filtering device with a hood (class TH2P or higher) may be easier to work in and can be used as an alternative to a respiratory mask and safety goggles. Note that if any gaseous potentially harmful substances are used another more adequate class of RPD might be needed depending on the substance/situation. This is the minimum standard we recommend, but in absence of such equipment, any protection covering nose and mouth probably has some benefit.
- Protective clothing including headwear which fully covers the hair must be worn; preferably disposable outer garments or coveralls, an impermeable apron or surgical gowns with long cuffed sleeves, plus an impermeable apron.
- Close-fitting protective goggles with side protection should be worn to stop virus contacting the conjunctivae (the mucous membranes of the eyes).
- Disposable protective shoe covers or rubber or polyurethane boots that can be cleaned and disinfected should be used.
- Opportunities for safe cleaning or disposal after use must be available. Disposable PPE should be properly discarded, and non-disposable PPE should be cleaned and disinfected using standard disinfection procedures.
- Hand hygiene measures (hand washing or disinfection) should be performed after removal of PPE.
- Workers should be trained in proper techniques of donning, removing and disposing of PPE, without contaminating themselves. Summary of order of removal of protective attire/equipment:
  - Remove gloves
  - Remove gown
  - Wash/decontaminate hands
  - Remove eye protection
  - Remove mask/respirator
  - Wash/decontaminate hands again

6. Proper but limited use of antiviral drugs

Use of antivirals should be restricted and under medical control in order to

- Minimise the risk of side-effects
- Prevent the development of drug resistance
- Conserve stocks

In countries where no outbreaks of highly pathogenic avian influenza are known or suspected

No prophylaxis for poultry workers is required.

In countries where one or more outbreaks of highly pathogenic avian influenza are known or strongly suspected

All workers exposed to infected birds or poultry (including those birds directly implicated in an outbreak of highly pathogenic avian influenza, and the birds in neighbouring areas being culled as part of the local control measures) should be offered prophylaxis. Those who are retrospectively recognised to have been exposed should receive post-exposure prophylaxis.

Local veterinary and public health authorities should collaborate in the development of a risk assessment, based on the local situation, the type of HPAI and expert advice, to determine which individuals should be considered at risk of exposure.

- Pre-exposure prophylaxis. Unless medically contra-indicated, workers should receive 75mg oseltamivir daily for the duration of time during which contact with infected poultry or contaminated surfaces occurs. This should be continued for 7 days following last exposure.
- Oseltamivir is presently not recommended for continuous use during more than 6 weeks. The risk of adverse effects from longer use are not known at present, but Canadian guidelines recommend that persons who have been on 6 weeks continuous oseltamivir prophylaxis discontinue use for a 2-week period prior to re-starting the medication. During this period persons should not work in an environment where they may be exposed to an HPAI.
- Post-exposure prophylaxis. After contact with infected birds, within 48 hours after exposure and for minimum 7 days. Oseltamivir is not recommended for children <13 years of age. However, recent evidence shows that it is safe and efficacious also in children[6]. Just as for adults, the dose is the same as for treatment (by body weight), but given once daily instead of twice.
- If oseltamivir has not been given prophylactically, and workers then present with symptoms suggestive of avian influenza, treatment with oseltamivir 75mg twice daily for 5 days should be initiated.

It is recommended that oseltamivir be readily available for the treatment of suspected H5N1 respiratory infections.

In order to avoid a false perception of full protection, workers under antiviral prophylaxis must be made aware of the need for general protective measures.

(There may be other antiviral drugs that could be used, but at present oseltamivir is the only centrally authorised agent in Europe; see EMEA website: www.emea.eu.int/htms/human/epar/a-zepar.htm).

7. Vaccination with normal seasonal influenza vaccine

Targeted vaccination with the current seasonal influenza vaccine is being recommended as one of several measures for reducing opportunities for the simultaneous infection of humans with avian and human influenza viruses. Minimising the opportunities for dual infections reduces the chance for viral reassortment and for the eventual emergence of a novel influenza virus with pandemic potential.
Note: This vaccination does not protect against infection with bird flu. This fact must be understood by those exposed so that they are still aware of the need for general protective measures.

In addition to usual target groups, the following should be considered for current seasonal flu vaccination:

- All persons who are expected to be in contact with poultry or poultry farms potentially being affected with highly pathogenic avian influenza, especially cullers involved in destruction of poultry, and people living and working on poultry farms where HPAI has been reported or is suspected or where culling takes place.
- Health care workers involved in the daily care of strongly suspected or confirmed human cases of influenza HPAI.
- Health care workers in emergency care facilities in areas where there is confirmed occurrence of influenza HPAI in birds.
- Close contacts of influenza HPAI human cases.

8. Close observation of people potentially exposed

All persons exposed to infected poultry, birds or their droppings should be under close monitoring by themselves, their employers and local health authorities. It should be clear that the responsibility for this happening lies with the employer though the follow-up will be by health authorities. Particular care will be needed when contract labour are involved. Persons involved in culling operations should check their temperature twice daily for up to 14 days following their last contact with poultry or their environment. Any illness (such as fever ≥38 ^{o}C, cough, sore throat, shortness of

breath, but also gastroenteritis) in themselves or their families must be immediately reported to the health authorities. Symptomatic persons should seek medical attention, should not self-medicate, should limit their social interactions and they should remain at home until free of fever for at least 24 hours, unless a diagnosis of influenza has been excluded.

A register of those exposed should be maintained by employers or contractors. Adherence to this and the above protective measures should be written into contracts. At the end of the outbreak a report should be prepared by the health authorities.

Suggestions for additional activities

- A serological follow-up of all persons involved in an HPAI outbreak should be considered, in order to acquire further scientific knowledge about the risk of transmission of AI viruses to humans. Such serology should always be supported by a WHO reference laboratory.
- These activities should be overseen by a group with both animal and human health experts established in each Member State.
- Specific surveillance for adverse events to antiviral drugs should be encouraged.

References

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3. Koopmans M, Wilbrink B, Conyn M, et al. Transmission of H7N7 avian influenza A virus to human beings during a large outbreak in commercial poultry farms in the Netherlands. Lancet 2004; **363**:587-593.

4. World Health Organization - Western Pacific Region Publications on Avian Influenza http://www.wpro.who.int/health_topics/avian_influenza/publications.htm

5. EFSA. Opinion of the AHAW Panel related to animal health and welfare aspects of Avian Influenza. Sept. 2005. http://www.efsa.eu.int/science/ahaw/ahaw_opinions/1145_en.html

6. Hayden FG, Belshe R, Villanueva C, et al. Management of Influenza in Households: A Prospective, Randomized Comparison of Oseltamivir Treatment With or Without Postexposure Prophylaxis. J Infect Dis 2004, **189**: 440-9.