

AVIAN INFLUENZA IN HUMANS

CDNA NATIONAL GUIDELINES FOR PUBLIC HEALTH UNITS

The Series of National Guidelines have been developed in consultation with the Communicable Disease Network Australia (CDNA) and endorsed by the Australian Health Protection Principal Committee (AHPPC). Their purpose is to provide nationally consistent advice and guidance to public health units (PHUs) in responding to a notifiable disease event. These guidelines capture the knowledge of experienced professionals, built on past research efforts, and provide advice on best practice based upon the best available evidence at the time of completion.

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Revision history			
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1.0	19 February 2009	VPDS, OHP	Updated URL and link to State and Territory legislation
1.1	Jan 2013		Redraft
1.2	Nov 2013	NSW	Redraft to make generic to all AI
1.3	April 2015	NSW	Update information including case definition to make current

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1. Summary

This guideline is concerned with the public health response to people with avian influenza (AI) infection, and people who have been exposed to another person or birds with AI infection.

It is not concerned with human pandemic influenza. In the unusual event that an AI strain transforms into one that is easily transmitted between humans, it is no longer avian influenza, but becomes human (and possibly pandemic) influenza. The response to human pandemic influenza is described in the national and state influenza pandemic management plans. The pandemic phases are outlined in the Australian Health Management Plan for Pandemic Influenza.¹ The case definitions have been developed to apply to all AI strains regardless of their pathogenicity classification in birds (see section 7). This recognises that any strain of avian influenza could emerge as a public health threat.

Public health priority

Urgent. Respond to a suspected case immediately on notification. Report details of the case to jurisdictional communicable diseases branch (CDB) within 1 hour of notification. Jurisdictional CDB should report confirmed cases to the National Incident Room on day of notification. Data entry should be completed within the same working day.

Case management

Suspected cases must be cared for in a single room, and if available, a negative pressure room. Cases should be treated with neuraminidase inhibitors, ideally within 48 hours of onset.

Contact management

Contacts of confirmed cases and infected birds must be rapidly identified, counselled about their risk, provided with neuraminidase inhibitors (if indicated), and placed under surveillance for 10 days after the last exposure.

2. The disease

Infectious agents

Avian influenza A virus. All AI viruses are influenza A viruses which are further divided into subtypes determined by haemagglutinin (H) and neuraminidase (N) antigens. At present, 16 H subtypes and 9 N subtypes have been identified in birds. Each AI virus has one of each H and N subtype occurring in many different combinations. The virulence is associated with the genetic properties of the virus.² AI viruses are classified as highly pathogenic avian influenza (HPAI) and low pathogenicity avian influenza (LPAI) in conformity with criteria established in relation to poultry by the World Organisation for Animal Health (OIE).³ Hence the use of the terms HPAI or LPAI only refers to the virulence of the AI virus in birds.

To date, only H5 and H7 subtypes have been known to cause outbreaks of HPAI in birds. Both LPAI and HPAI viruses can however rarely cause illness in humans following very close contact. It is believed that human pandemic influenza strains may arise from AI viruses.² No assumption can be made about the clinical significance of a novel AI virus in humans based on the pathogenicity designation in birds.⁴ One HPAI strain, the H5N1 avian influenza virus, has caused serious infections in humans and deaths during poultry outbreaks overseas.⁵ One LPAI, H7N9, has caused serious infections in humans and deaths in China however has not been linked with clinical disease in birds.⁶

Note: As information as to risks and timelines becomes better documented public health staff should review the latest literature on transmission and timelines during investigations.

Reservoir

The species in the orders *Anseriformes* (ducks, geese, swans) and *Charadriiformes* (shorebirds, waders, gulls) are regarded as important reservoir hosts and disseminators of AI viruses, but rarely display clinical signs of infection.² In this document, these reservoir birds are referred to collectively as “waterbirds”. However it is reasonable to assume all avian species are susceptible to AI infection.³

Mode of transmission

Bird-to-bird

Infected birds may shed virus in their saliva, nasal and respiratory secretions, and faeces depending on many factors such as the type of bird, the virus subtype and the presence of other diseases. Faeces of infected birds can contain large amounts of virus with faecal-oral transmission the predominant mode of spread between birds. Asymptomatic waterbirds may directly or indirectly introduce the virus into poultry flocks via contaminated excretions from infected birds or via contaminated environments.⁷ Secondary dissemination is by fomites, movement of infected poultry, and possibly airborne. LPAI infection is primarily a localised infection in poultry and HPAI infection typically presents as a more systemic infection.⁷

Bird-to-person

Transmission of AI infection from birds to humans is rare. When it has occurred, it is believed to have resulted from close contact with infected poultry or breathing in dust contaminated with their excretions. The virus can survive on poultry products (including eggs and blood),⁸ however no infection has been documented from eating properly cooked eggs and meat from infectious birds. Transmission has been thought to occur by ingesting uncooked poultry products (including raw blood) from H5N1 infected poultry.⁹

Person-to-person

The spread of AI viruses from one ill person to another through prolonged, unprotected, close contact has been reported very rarely, and has been limited, inefficient and not sustained.¹⁰⁻¹¹

Incubation period

The incubation period for AI in humans may be longer than that for normal

seasonal influenza, which is around two to three days. Current data indicate an incubation period will typically (and for public health purposes should be considered to) range from one to ten days.¹¹⁻¹³ This may vary depending on the AI strain.

Infectious period

No detailed studies have been conducted of infectivity of AI viruses in humans. Viral shedding of H5N1 has been detected in some patients up to 21 days after symptoms begin,¹⁴⁻¹⁵ and up to 20 days after symptoms begin for H7N9 patients,¹⁶ however the low number of secondary cases detected indicates that viral shedding is not an accurate reflection of AI infectivity in humans.

Based on data on human influenza subtypes:

- Adults and children older than 12 years of age are thought to be infectious typically from the day before¹⁷ (and up to a maximum of 5 days before)¹⁸ symptoms begin until usually 7 days after¹⁹ (and up to a maximum of 14 days after)²⁰ symptoms begin. For practical public health purposes, adults and children older than 12 years of age should be considered infectious from 1 day before symptoms begin until 7 days after symptoms begin.
- Children up to 12 years of age are thought to be infectious typically from the day before (and up to a maximum of 6 days before)¹⁹ symptoms begin until usually 7 days after^{19,22} (and up to a maximum of 27 days after)^{19,23-24} symptoms begin. For practical public health purposes, children up to 12 years of age should be considered infectious from 1 day before symptoms begin until 7 days after symptoms begin.
- Severely immunocompromised persons can shed virus for weeks or months,²⁵⁻²⁷ and should be considered on a case-by-case basis.

Clinical presentation and outcome

The clinical presentation of AI in humans may be highly variable both between and within haemagglutinin subtypes. As with seasonal human influenza, a person infected with AI may have no symptoms, mild upper respiratory symptoms, or symptoms typical of influenza (fever, cough, fatigue, myalgia, sore throat, shortness of breath, runny nose, headache); diarrhoea may also occur.⁵

Mild symptoms, including conjunctivitis and gastrointestinal symptoms, have been typically associated with several AI subtypes and should be considered in any person who has had close exposure to birds infected with any subtype of AI.⁸ An outbreak of LPAI H10N7 on a chicken farm in Australia was associated with conjunctivitis and mild respiratory symptoms in seven abattoir workers processing birds from this farm. H10 influenza subtype was laboratory confirmed in two of the cases.¹² A large outbreak of HPAI H7N7 in the Netherlands in 2004 was reported to have resulted in a rate of conjunctivitis of 8%, influenza like illness in 2%, and one death associated with respiratory failure in those exposed.²⁸

The H5N1 subtype has caused viral pneumonia with a high case fatality rate, and in a small number of cases, diarrhoea, vomiting, abdominal pain, chest pain, and bleeding from the nose and gums have also been reported as early symptoms.⁵ Initial data on the H7N9 subtype which emerged in eastern China in February 2013 indicates that human illness is characterised by rapidly progressive pneumonia,

respiratory failure and acute respiratory distress syndrome (ARDS) with a high case fatality. However some confirmed cases, particularly young children, have been asymptomatic or associated with clinically mild upper respiratory illness.^{6,11}

Persons at increased risk of disease

The likely scenarios in which a human infection with avian influenza could occur in Australia are:

- a person is infected overseas after close contact with infectious material from birds or a human case and travels to Australia during the incubation or infectious periods.
- a laboratory worker is infected while working with human or animal specimens that contain avian influenza.
- a person is infected in Australia after close contact with infectious material from infected local birds. Those at highest risk of these exposures are commercial poultry workers who work directly with potentially infected poultry.

Disease occurrence and public health significance

As of June 2015 there have been no known bird or human cases in Australia associated with the H5N1 or H7N9 viruses which have caused human illness and death overseas. Recent poultry outbreaks of HPAI H7 (2012 and 2013),²⁹⁻³⁰ LPAI H4 and LPAI H9 (2012)³¹ and LPAI H10 (2010)¹² subtypes have been recorded in New South Wales; only the H10 subtype was associated with recognised likely transmission of mild illness to humans. An LPAI H5 outbreak also occurred in a Victorian duck farm in 2012.³²

3. Routine prevention activities

The prevention of AI in Australians principally relies on:

1. Advice to travellers to practice good hand hygiene and avoid close contacts with birds in wet markets or on farms, in countries where AI is endemic in domestic poultry.³³
2. Good occupational health and safety practices including use of appropriate personal protective equipment (PPE) and hygiene measures for anyone working with potentially infected birds.²
3. Communication and collaboration between the jurisdictional agencies responsible for human and animal health. In this document, jurisdictional agencies responsible for animal health, including the surveillance and control of AI in birds, are referred to collectively as animal health agencies. Animal health agencies should involve human health authorities in human risk assessment and control. Jurisdictional Communicable Disease Branches (CDBs) must also notify the jurisdictional animal health agencies of any human cases for investigation of possible bird sources or risk to poultry.

Threat and vulnerability

Various strains of AI are enzootic in bird populations around the world. Outbreaks in Australian domestic poultry have been associated with poor biosecurity, confirmed or circumstantial evidence of contact with waterbirds, or inadequately treated surface water potentially contaminated by waterbirds or domestic ducks.³⁴ AI-contaminated materials carried by humans or material brought into Australia from AI-infected countries may also pose a risk of infecting poultry or humans.

Risk mitigation

Biosecurity measures have been put in place in many commercial bird facilities to minimise the risk of future AI infections in birds. However, many facilities (notably free range farms) may present opportunities for exposure of domestic poultry to waterbirds and/or their excretions. Strict quarantine and inspection measures at Australian airports and seaports are designed to prevent the importation of bird products into Australia. Jurisdictional animal health agencies have contingency plans in place to minimise the impact of an outbreak of AI in Australia. These procedures are outlined in the Australian Veterinary Emergency Plan (AUSVETPLAN).²

People co-infected with avian influenza and human influenza infections are thought to provide the potential for re-assortment of genes from the two strains of influenza that could result in a new human pandemic influenza strain. Therefore, if human influenza is currently circulating in the community, poultry workers and other people directly involved in culling AI infected poultry should be vaccinated with the current recommended seasonal influenza vaccine. While vaccination will not prevent AI, it will help reduce the risk of co-infection, re-assortment and a pandemic.³⁵

4. Surveillance objectives

1. Rapidly identify, isolate, and treat human cases and prevent transmission to their contacts.
2. Assess the risk to humans from AI infected birds, and identify, counsel and provide prevention advice to those at risk.
3. Understand the epidemiology of AI in humans in Australia, in order to identify risk factors and prevent transmission.

5. Data management

Within 1 working day of confirmation, enter confirmed case on state or territory notifiable diseases database.

6. Communications

Immediately report suspected and confirmed cases of AI in humans to the jurisdictional CDB by telephone with the patient's age, sex, date of onset, laboratory status, possible sources of infection, other people thought to be at risk and follow up action taken. Any suspect or confirmed AI infected bird(s) should also be reported to the jurisdictional CDB to assess the risk of infection in human contacts.

The jurisdictional CDB should immediately notify confirmed human AI cases to the National Incident Room, and the jurisdictional animal health agency.

7. Case definition

Avian Influenza in Humans (AIH) Case Definition

Reporting

Both confirmed cases and probable cases should be notified. Suspected cases should not be notified.

Confirmed case

A confirmed case requires laboratory definitive evidence AND clinical evidence

Laboratory definitive evidence

- Isolation of an AI virus
- OR
- Detection of AI by nucleic acid testing using two different targets, e.g. primers specific for influenza A and AI haemagglutinin (genetic sequencing should be employed to confirm diagnosis);
- OR
- A fourfold or greater rise in antibody titre to the AI virus detected in the outbreak (or AI virus suspected of causing the human infection), based on testing of an acute serum specimen (collected 7 days or less after symptom onset) and a convalescent serum specimen. The convalescent neutralizing antibody titre must also be 80 or higher.
- OR
- An antibody titre to the AI virus detected in the outbreak (or AI virus suspected of causing the human infection) of 80 or greater in a single serum specimen collected at day 14 or later after symptom onset. The result should be confirmed in at least two different serological assays (i.e. haemagglutinin-inhibition, microneutralisation, positive Western blot, etc).

Note: Tests must be conducted in a national, regional or international influenza laboratory whose AIH test results are accepted by WHO as confirmatory

Clinical evidence

An acute illness characterised by:

- a. Fever ($>38^{\circ}\text{C}$) or history of fever AND one or more of; cough OR rhinorrhoea OR myalgia OR headache OR dyspnoea OR diarrhoea;

OR

- b. Conjunctivitis

OR

- c. infiltrates or evidence of an acute pneumonia on chest radiograph plus evidence of acute respiratory insufficiency (hypoxaemia, severe tachypnoea).

Probable case

A probable case requires laboratory suggestive evidence **AND** Clinical evidence **AND** Epidemiological evidence

Laboratory suggestive evidence

Confirmation of an influenza A infection but insufficient laboratory evidence for AIH infection.

Clinical evidence

As with confirmed case

Epidemiological evidence

One or more of the following exposures in the 10 days prior to symptom onset:

- a. Close contact (within 1 metre) with a person (e.g. caring for, speaking with, or touching) who is a probable, or confirmed AIH case;
- b. Exposure (e.g. handling, slaughtering, defeathering, butchering, preparation for consumption) to poultry or wild birds or their remains or to environments contaminated by their faeces in an area where AI infections in animals or humans have been suspected or confirmed in the last month;
- c. Consumption of raw or undercooked poultry products in an area where AI infections in animals or humans have been suspected or confirmed in the last month;
- d. Close contact with a confirmed AI infected animal other than poultry or wild birds (e.g. cat or pig);
- e. Handling samples (animal or human) suspected of containing AI virus in a laboratory or other setting.

Suspected case

A suspected case requires clinical evidence **AND** epidemiological evidence

Clinical evidence for suspected case

As with confirmed case

Epidemiological evidence

As with probable case

Note: For overseas exposures, an AI-affected area is defined as a region within a country with confirmed outbreaks of AI strains in birds or detected in humans in the last month (seek advice from the National Incident Room when in doubt). With respect to the H5N1 AI outbreak that commenced in Asia in 2003, information regarding H5-affected countries is available at:

<http://gamapserver.who.int/mapLibrary/>. With respect to the H7N9 outbreak that

commenced in eastern China in 2013, information regarding H7-affected countries is available at http://www.who.int/influenza/human_animal_interface/influenza_h7n9/en/

8. Laboratory testing

Specimen collection

Laboratory confirmation should be urgently sought to confirm all suspected cases. Consult with the virologist, but nose AND throat swabs (usually for adults) and conjunctival swabs (even in the absence of conjunctivitis) are recommended. Sputum specimens may be more effective for detecting H7N9 and are recommended wherever possible.³⁷

Collect baseline and convalescent sera for symptomatic cases. Do not collect sera for asymptomatic contacts.

Viral swabs should be collected and transported using viral transport medium (VTM) or universal transport medium (UTM).

Samples should be tested at a reference laboratory using:

- PCR for AI
- Viral culture and PCR for influenza.

Nasopharyngeal and throat swabs may induce coughing and should preferably be collected in a negative pressure room, if available, by health care workers (HCWs) wearing full PPE.³⁸ Write on specimen forms and containers before entering the patient's room to collect the specimens.

The laboratory should be notified in advance by telephone that the specimens will be sent, and specimens should be clearly marked URGENT: SUSPECTED AVIAN INFLUENZA to ensure prioritisation by the laboratory.

Specimens should be packaged and transported according to the National Pathology Accreditation Advisory Council (NPAAC) requirements.³⁹ Diagnostic specimens for AI testing are classified as Biological Substances, Category B. Amplified viable material including viral cultures are classified as Infectious Substances, Category A. The Public Health Laboratory Network may advise on packaging and transport of these specimens.

As AI is often an unlikely diagnosis in most suspected cases, other relevant tests should be done concurrently to identify an alternative diagnosis.

9. Case management

Response times

Immediately on notification of a suspected case, begin follow up investigation and notify the jurisdictional CDB. For confirmed and probable cases, the "Avian Influenza (AI) in humans - Investigation Form" (see appendices) should be completed and data transferred to the jurisdictional CDB the same day.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the case's health carers. Regardless of who does the follow-up, for confirmed cases, PHU staff should ensure that action has been taken to:

- Confirm the onset date and symptoms of the illness
- Confirm results of relevant pathology tests, or recommend that tests be done (the laboratory should be advised before sending the specimens)
- Find out if the case or relevant care-giver has been told what the diagnosis is before beginning the interview
- Seek the doctor's permission to contact the case or relevant care-giver
- Review case and contact management
- Ensure appropriate infection control professionals are notified and infection control policies are available to those caring for the case
- Identify the likely source of infection
- Obtain a travel, occupational and recreational history, and follow up clinical results and case details.

Note. If interviews with suspected cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection control practices, be competent in using appropriate personal protective equipment (PPE),³⁹⁻⁴⁰ and ideally have been vaccinated with the current (human) influenza vaccine.

Case treatment

Treatment of a case is the responsibility of the clinician in consultation with an expert virologist. Neuraminidase inhibitors (e.g. oseltamivir or zanamivir) have been shown to attenuate disease in cases of human influenza if started within 5 days of the onset of illness (ideally within 48 hours).¹ They may also be effective for treating AI.

Education

Provide the *Avian Influenza Fact Sheet* to cases. Ensure that they are aware of the signs and symptoms of AI, the requirements of isolation, contact details of the PHU and the infection control practices and precautions that can prevent the transmission of AI.

Isolation and restriction

Infectious cases must be isolated until no longer infectious (see *Section 2*). Advice from the facility's infection control professional should be sought.

Health care workers and others who come into contact with the case must use airborne, droplet, contact and standard infection control precautions including appropriate PPE (gown, gloves, protective eyewear and P2 respirator).⁴⁰⁻⁴¹

The mode of transmission is unclear, but postulated to be mainly droplet and direct contact. However, the possibility of airborne transmission remains, and airborne precautions must be used.

Patients should be managed in a single room with airborne, droplet, contact and standard precautions and if available, a negative pressure room.

Similarly, in a primary care setting such as a GP surgery, patient isolation and,

droplet, contact and standard infection control precautions should be employed.³⁹⁻

⁴⁰ Acute cases should be managed in hospital. When discharged home, a comprehensive discharge plan must be made by the treating hospital.

Active case finding

Where transmission has been identified from poultry to humans, Public Health Units should actively search for other cases in people who were exposed to the infected poultry and initiate active surveillance in these people for the duration of the infectious period.

10. Environmental evaluation

Where local transmission of AI is thought possible, a thorough review of contributing environmental factors should be performed. If transmission is thought to be poultry-related, the environmental assessment should include a review of opportunities for exposure to infected birds, in collaboration with jurisdictional animal health agencies and the jurisdictional work safety authority. If health care-associated infection is suspected, the adequacy of infection control procedures must be reviewed.

Staff conducting the environmental evaluation must have a thorough understanding of infection control practices, be competent in using personal protective equipment (PPE), and have been vaccinated with the current (human) influenza vaccine. They must follow airborne, droplet, contact and standard infection control precautions, including appropriate PPE (gown, gloves, protective eyewear and P2 respirator).³³

11. Contact management

Identification of contacts

AI is not easily transmitted between humans, and probably requires close and prolonged contact. Public health interventions need careful consideration on a case-by-case basis. Following a report of a confirmed case, an expert panel should be convened by the jurisdictional CDB to help plan the public health response. The panel may include experts in human influenza and poultry influenza, animal health agencies, virologists, infection control, infectious disease physicians and PHUs.

Contact definition

The evidence base for defining what constitutes "contact" with a case is limited. For the purposes of the contact definition, it is taken to mean being within one metre (e.g. caring for, speaking with, or touching) of an infectious case within the previous 10 days, in the absence of appropriate infection control. The expert panel will advise on a more specific contact definition as required. Where a case has travelled on an aeroplane, contacts are defined as persons sitting in the seats immediately beside the case, due to the lower rate of person-to-person transmission of AI viruses. However, the expert panel should advise on contacts to be traced.

Post-exposure Prophylaxis

Antiviral medications may be effective in preventing disease in contacts. Unless the available evidence clearly shows a lack of efficacy, close contacts of confirmed

cases will generally be offered neuraminidase inhibitors (e.g. oseltamivir or zanamivir) to prevent infection. The expert panel will provide more specific advice as needed.

Education

Contacts should be counselled about their risk and the symptoms of AI and placed under surveillance (see Appendix 3 “Avian influenza (“bird flu”) advice for people under surveillance” in appendices).

Isolation and restriction

Contacts are not required to isolate themselves from the community but must adhere to advice regarding self-monitoring until the incubation period expires (see *section 2*).

The PHU should ensure that contacts are communicated with daily for 10 days after the last exposure to determine if symptoms of AI have developed. If symptoms develop, the contact must be rapidly isolated until AI is excluded. The PHU should arrange assessment by an appropriately skilled medical practitioner. This must take place in a setting where risk is managed through the use of appropriate infection control precautions. If this occurs at an emergency department, arrangements should be made to ensure that the patient does not wait in any common areas and will be placed immediately in a single room, ideally with negative pressure for assessment.

12. Special situations

AI in birds in Australia

Where a jurisdictional animal health agency reports any outbreak of AI in birds in Australia, the PHU is responsible for ensuring that the risk of human infection is minimised. The public health actions should be guided by the expert panel convened by the jurisdictional CDB.

Issues to be addressed include:

- Working with the jurisdictional animal health agency and work safety authority to ensure that people entering the area deemed by the jurisdictional animal health agency to harbour infection have been trained in the use of PPE, and use it where the potential for exposure to infected birds, their faeces, eggs, or the dust from infected birds is present.
- Providing oral and written information to people who were exposed to the infectious birds about the risk of infection, the methods of minimising the risk, symptoms to be alert for, and to report to the PHU immediately, should symptoms occur.
- Assessing whether people who were exposed to infectious birds require anti-viral medicine, and if so arranging supply (via the jurisdictional CDB) and administration of the medicine. Ordinarily anti-viral medicines will be limited to persons with direct exposure to infected birds in the absence of effective PPE.
- Placing exposed people under surveillance for ten days. Should symptoms develop, the PHU should arrange for a medical assessment and diagnosis of the person.
- People co-infected with avian influenza and human influenza infections are

thought to provide the potential for re-assortment of genes from the two strains of influenza that could result in a new human pandemic influenza strain. Therefore, if human influenza is currently circulating in the community, poultry workers and other people directly involved in culling AI infected poultry should be vaccinated with the current recommended seasonal influenza vaccine. While vaccination will not prevent AI, it will help reduce the risk of co-infection, re-assortment and a pandemic.³⁵

- Processing (slaughter, evisceration and de-feathering) of infected birds have the potential to release large amounts of the virus. Workers should wear appropriate PPE including goggles and P2 respirators during processing and monitor for symptoms for 10 days from the last contact.²
- Jurisdictional animal health agency staff should advise on biosecurity measures during transport of affected birds; and restrictions on the use of feathers and waste from processing plants.²
- Egg and poultry products from birds affected by LPAI are not considered to pose a risk to human health, provided they are cooked appropriately, as is currently advised to avoid other pathogens associated with poultry.⁴²⁻⁴⁴

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14. Appendices

The following documents are included in the appendices:

- Appendix 1: Avian Influenza in Humans - Factsheet
- Appendix 2: Avian influenza in humans - Information for Contacts
- Appendix 3: Avian Influenza in humans - Advice for People Under Surveillance.
- Appendix 4: Avian Influenza in humans - PHU Checklist
- Appendix 5: Avian Influenza in humans - Investigation Form

15. Jurisdiction specific issues

Links to State and Territory Public Health Legislation, the Quarantine Act and the National Health Security Act 2007.

<http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-state-legislation-links.htm>

Appendix 1: Avian Influenza in Humans - Factsheet

Avian influenza ("bird flu")

Avian influenza (AI) is primarily a disease of birds. Overseas, humans have rarely been infected after close contact with infected birds. To prevent infection, avoid contact with birds and their droppings in affected countries.

What is avian influenza (bird flu)?

- AI is an infectious disease of birds, caused by a number of different strains of AI virus.
- Some AI viruses circulate in wild bird populations causing no disease or only mild disease.
- Infection of domestic poultry, such as chickens, can cause severe disease.
- On rare occasions, some strains of AI virus can infect and cause disease in humans.
- An AI virus, called H5N1, was first recognised in 1997 in Hong Kong. This strain reappeared in late 2003 and rapidly spread to birds in other countries in Asia; and later to some areas of the Middle-East, Europe and Africa.
- The H5N1 AI strain has caused serious infections in humans and deaths. To date this strain of AI has not been found in Australia.
- Another AI virus, called H7N9 avian influenza, was first recognised in early 2013 in eastern China. The H7N9 AI strain has also caused serious infections in humans and deaths. To date this strain of AI has not been found in Australia.
- Australia has had a number of small outbreaks of other strains of AI on poultry farms associated with very few mild human infections.

What are the symptoms?

- When people are infected with an AI virus, no symptoms or mild symptoms such as red sore eyes (conjunctivitis) occur most frequently.
- However infection with some strains of AI such as H5N1 or H7N9 can cause symptoms similar to severe human influenza (fever, cough, tiredness, muscle aches, sore throat, shortness of breath, runny nose, headache). Pneumonia, encephalitis (inflammation of the brain) and diarrhoea may occur.
- Symptoms generally appear between 2 and 10 days following exposure.

How is it spread?

- AI viruses infect people following close contact with infected poultry or materials contaminated with poultry feathers, faeces or other waste from poultry facilities.
- Humans infected with an AI virus do not easily transmit the infection to others. When this has occurred it seems to have been due to close contact with a sick person over several days.

- Eating properly cooked poultry products including chicken or eggs does not result in AI infection.

Who is at risk?

- Most people are not at risk of this disease, except if they come into contact with infected birds or their secretions while in affected areas of the world, or possibly if caring for a person infected with the virus.

How is it prevented?

- People who are in contact with patients with AI or who are working with infected birds must use personal protective equipment (including P2 respirators, goggles, gloves and protective clothing), follow excellent infection control, and may require anti-influenza medication. Vaccination with seasonal influenza vaccine is strongly recommended.
- Laboratory workers handling specimens must follow special safety requirements.
- A human vaccine is not available for avian influenza.

People travelling to areas affected by avian influenza should:

- avoid poultry farms and live bird “wet” markets
- wash their hands thoroughly after handling uncooked poultry products such as meat or eggs, and
- ensure that poultry or poultry products are cooked thoroughly before eating.

How is it diagnosed?

- AI infection can be diagnosed in people with symptoms who have a history of exposure to the virus using specimens of blood, or from swabs of the nose and throat. Testing is done at specialised laboratories.

How is it treated?

- Specific anti-influenza drugs are likely to be effective against AI in humans and are used to treat people with AI virus infections. Isolation of the patient and supportive medical care may be necessary.

What is the public health response?

- The Australian Quarantine and Inspection Service conducts surveillance for the illegal importation of birds or bird products at Australian borders.
- Doctors and laboratories must notify people with suspected AI to the local public health unit.
- Should human cases be suspected in Australia, the local public health unit will work with the patient, the treating doctors, and the laboratory to confirm the diagnosis.
- Cases will be isolated from others to prevent further infections.
- Close contacts of cases will be counselled about the risk of infection. Should they develop symptoms, they will also be isolated and tested for AI.

For more information

Australian Government Department of Health information hotline:
1800 004 599.

Related links

- Australian Government Department of Health - Avian influenza
https://www.health.gov.au/internet/main/publishing.nsf/Content/health-avian_influenza-index.htm
- World Health Organization
http://www.who.int/influenza/human_animal_interface/avian_influenza/en/
- Travel Advice (Australian Government Department of Foreign Affairs and Trade)
<http://www.smartraveller.gov.au>
- U.S. Centers for Disease Control and Prevention
<http://www.cdc.gov/flu/avianflu/>

For local information please contact < insert state CDB number here >

Appendix 2: Avian influenza in humans - Information for Contacts

A contact is someone who may have been exposed to avian influenza from poultry or other birds.

- **Avian influenza (AI), commonly called bird flu, is an infectious viral disease of birds.**
- **Most AI viruses either do not infect humans or cause mild symptoms; however some strains have caused serious infections in people overseas.**
- **When AI is identified in birds it is difficult to know what risk, if any, it presents to humans. For this reason it is best to take appropriate precautions and closely monitor your health.**

Avian Influenza viruses

- Avian influenza (AI) viruses are common in wild water birds throughout the world, and usually cause them few problems. AI outbreaks among poultry occur worldwide from time to time, including Australia.
- Avian influenza viruses are classified on their pathogenicity (capacity to cause disease) in poultry. Most strains of AI are classified as low pathogenicity avian influenza (LPAI) and cause few signs of illness in infected birds. There is a risk that if LPAI is allowed to circulate in poultry populations, the virus could mutate into a highly pathogenic form. This is why the presence of an AI virus in poultry is always a cause for concern, even when the initial signs of infection in poultry are mild.
- Highly pathogenic avian influenza (HPAI) strains cause severe and extremely contagious illness among infected poultry resulting in high death rates in chickens and turkeys.
- The pathogenicity classification of an AI virus does not necessarily reflect its ability to cause disease in humans.
- Only a few AI strains have infected people. This is usually a mild illness, including conjunctivitis (eye infections) and flu-like symptoms.
- Some strains of AI viruses can also cause serious infections in people. One HPAI strain, the H5N1 AI virus, has caused serious infections and deaths in humans. The death rate among those infected with H5N1 AI virus is high in those that become infected. Human infections have occurred predominantly in South East Asia and the Middle East. To date, this strain of AI has not been found in Australia.
- One LPAI strain, the H7N9 AI virus, has also caused serious infections and deaths in humans in China. To date, this strain of AI has not been found in Australia.

How do people become infected with Avian Influenza?

- Infected birds shed large quantities of virus in their faeces which contaminate their surrounding environment.

- Direct contact with infected poultry, or surfaces and objects contaminated by their faeces, is the main way that humans might become infected. Contaminated dust may also be breathed in or rubbed into the eyes,
- Exposure is also likely during slaughter, defeathering, butchering, and preparation of poultry for cooking.
- AI cannot be transmitted to humans through the consumption of properly cooked poultry meat or eggs.

Does the Avian Influenza virus spread easily from birds to humans?

- No. Typically avian influenza viruses lack the ability to infect and replicate well in humans. However, changes in the virus or exposure to large amounts of virus may result in human infections.

Personal Protective Equipment (PPE) guidance

- Protection of personnel who might come into contact with AI-infected birds is important to the success of the response plan. While the risk of transmission of AI is low, as a precaution people working on or entering an infected premises or involved in other activities (eg. cullers, composters or veterinarians performing field post-mortems) should adopt the following personal protective measures to reduce their risk of infection.

Recommended personal protection measures for workers:

- Wear personal protective equipment (PPE) including foot or shoe covers, respiratory protection (P2 respirator) and eye protection (air-tight goggles).
- Seek expert advice and instruction on the correct use and safe disposal of PPE, and general infection control.
- Ensure PPE is either safely disposed of or appropriately cleaned after use.
- Wash hands before and after handling animals or touching surfaces contaminated by bird secretions (faeces, respiratory secretions or saliva or contaminated products, such as litter), and after removing or handling PPE.
- Ensure response personnel have received the current seasonal flu vaccine (see under Vaccination below).
- Discourage anyone who is unwell, particularly people with a suspected viral infection, from entering a poultry house, a response location or processing facility.

Vaccination

- Vaccination with the current seasonal influenza vaccine is recommended for anyone who has been directly exposed to AI-infected birds or may be exposed during their work. Ideally, influenza vaccination should occur at least 14 days prior to exposure.
- It is important to remember that the human influenza vaccine is **not** likely to protect against AI.
- Influenza vaccination is recommended because it helps to avoid someone becoming infected with both human and avian influenza strains at the same time, causing serious illness. If this were to occur there is also a small possibility that the two viruses could mix (called reassortment) and produce a new, highly

infectious human influenza virus that would pose a threat to their families and the wider community.

Self monitoring by workers and other people exposed

- Workers and other people who have been in close contact with AI-infected birds should monitor their health while working with infected birds or infected poultry products, and for ten days after the last exposure.
- Any new symptoms should be reported to your local Public Health Unit (see below).

Self monitoring involves watching for any new symptoms of illness, particularly the following:

- Fever $>38^{\circ}\text{C}$ (check your temperature each day), or chills or shakes
- Respiratory symptoms (e.g. sore throat, cough, difficulty breathing)
- Extreme tiredness or collapse due to exhaustion
- Headache, neck stiffness, and muscle or joint aches
- Nausea, vomiting, diarrhoea
- Red, sore eyes (conjunctivitis).

If new symptoms are detected:

- Report the illness to your local Public Health Unit (see contact details below)
- Phone your doctor for an appointment and report that you may have been in contact with the AI virus.
- Isolate yourself from others as much as possible until medically assessed
- Practice good respiratory hygiene by covering your mouth when coughing or sneezing. Wash your hands after coughing, sneezing, or using tissues or handkerchiefs. Dispose of used tissues in a bin.
- **In a medical emergency always seek immediate health care or phone 000.**

Public Health Unit Contact Details

For further health information or to report illness, phone your local Public Health Unit.

Public Health Unit:..... **Phone number:**

Additional Information:

- Australian Government Department of Health information hotline:
1800 004 599.
- Australian Government Department of Agriculture Avian Influenza Factsheet:
<http://www.daff.gov.au/animal-plant-health/pests-diseases-weeds/animal/avian-influenza>
- World Health Organization Avian Influenza Factsheet:
http://www.who.int/mediacentre/factsheets/avian_influenza/en/index.html

Appendix 3: Avian Influenza in humans - Advice for People Under Surveillance.

What is meant by being "under surveillance"?

There is a small risk that you will develop avian influenza because you have been exposed to a person suspected of having this disease. Your health needs to be closely monitored until the risk period is over. Staff from your local Public Health Unit will contact you daily to check on your health. As long as you remain free of symptoms, you do not need to be isolated from the community and may continue your normal daily activities, including work.

What do I have to do?

You are required to monitor your health for 10 days after you were last exposed to a person with avian influenza. You must:

- measure your body temperature every morning at 10:00 am, and record it in the table provided
- watch out for any symptoms (see box over page)
- If you develop a temperature greater than 38°C or any symptoms:
 - isolate yourself from other people and seek medical attention (phone ahead first)
 - contact the Public Health Unit.

You and others in your household need to be careful with hygiene and thoroughly wash your hands with soap and running water for 10 seconds (or use alcohol-based hand rubs), especially after contact with secretions from your nose and mouth, (e.g., after blowing your nose, coughing, or sneezing), before eating, or after using the toilet.

Date of last contact with an avian influenza case: _____

Monitor health until: _____

How to record your body temperature. Follow these instructions carefully.

To ensure accurate measurement of your temperature, **do not** take your temperature for 30 minutes after:

- having a hot or cold drink,
- having a hot shower or bath
- exercising
- smoking.

Take your temperature before taking medications that lower your temperature (e.g., aspirin, ibuprofen, and paracetamol-containing drugs such as Panadol, Panadeine, Dymadon). Wait for 4 hours before taking your temperature if you have taken these medications.

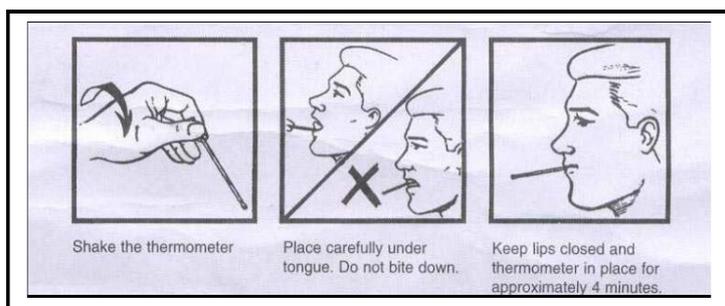
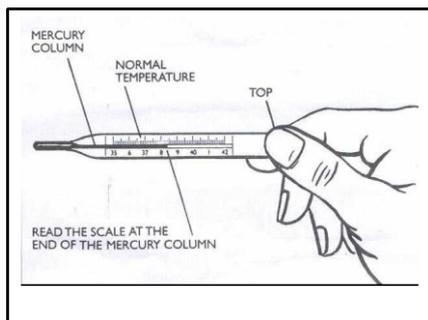
Using a digital thermometer: (see image below)

- Press on/off button
- Wait until thermometer resets and beeps
- Place tip of the thermometer under the tongue or in the ear
 - (according to the type)
- Wait until the thermometer beeps
- Record the temperature and the time it was taken
- Contact the Public Health Unit if your temperature is higher than 38°C.
- Consult the manufacturer's instructions for advice on cleaning the digital thermometer.

Using a mercury thermometer: (see image below)

- Hold the thermometer firmly by the top and shake downwards firmly
- Shake the thermometer until the mercury level falls below 35°C
- Place the thermometer bulb under the tongue and leave in place for 4 minutes (monitor with a clock). Do not bite or knock the thermometer. For some (e.g., children) it may be easier and safer to place the thermometer under their arm
- Record the temperature and the time it was taken

After use wash the thermometer in water and detergent.



Symptoms of avian influenza in humans and what to do if you get them

- Symptoms include fever **and** cough, severe fatigue, headache, sore throat, runny nose, muscle/joint aches, shortness of breath and inflamed eyes.

If you do develop a fever greater than 38°C or start to feel unwell with any of these symptoms:

- isolate yourself from other people, and seek medical attention (phone ahead first)
- make sure all household members continue very good hygiene practices, especially regular hand-washing.

Contact the _____ Public Health Unit on _____ (BH) and _____ (AH)

Table for recording temperature and symptoms (Record for 10 days)

Name _____ Monitor temperature until ___/___/___

Day	Date	Time temperature taken	Temperature	Symptoms, if any
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Appendix 4: Avian Influenza in humans - PHU Checklist

Patient ID number: _____

Contact the patient's doctor to:

- Obtain patient's history
- Obtain patient's contact details and permission to contact the patient
- Confirm results of relevant pathology tests
- Determine if others were exposed in the clinic

Contact the patient (or care giver) to:

- Identify likely source of infection
- Confirm onset date and symptoms of the illness
- Check infection control measures are in place
- Identify contacts and obtain their contact details
- Complete AI in Humans–Reporting Form
- Provide with AI Factsheet

Contact laboratory to:

- Check samples received and obtain any outstanding results

Confirm case

- Assess information against case definition

Contact patient's contacts to:

- Assess risk of AI (exposure history)
- Determine current symptoms
- Explain symptoms and restrictions
- Recommend intervention if needed (anti-influenza medicines)
- Provide with and explain AI ("Bird flu") and 'Information for Contacts' factsheets
- Ensure access to a thermometer

Other issues:

- Report details of case and action plan to state/territory CDB
- Assess and arrange best method for delivering intervention to contacts
- Consider a media release
- Enter case data onto notifiable diseases database
- Report human cases to jurisdictional animal health agency for investigation of possible bird sources or risk to poultry

Appendix 5: Avian Influenza in humans - Investigation Form

AVIAN INFLUENZA (AI) IN HUMANS

(TO BE COMPLETED FOR SUSPECTED AND CONFIRMED CASES)

Case details			NDD no.	_____	
Surname	_____	Given name	_____	Sex	M / F
DOB	__/__/__	Age	___ yrs/ ___ mths		
Address	_____				
Suburb	_____	Postcode	_____	Telephone	_____
Other contact	_____			Telephone	_____
Occupation/school	_____			Telephone	_____
Indigenous	<input type="checkbox"/> Aboriginal <input type="checkbox"/> Torres St Islander <input type="checkbox"/> both Aboriginal and TSI <input type="checkbox"/> not Indigenous <input type="checkbox"/> not stated	Country of Birth	<input type="checkbox"/> Australia <input type="checkbox"/> Other: <i>specify</i> _____	Language	<input type="checkbox"/> English <input type="checkbox"/> Other: <i>specify</i> _____

Disease	
Onset of First Symptoms	__/__/__ Time _____
Fever >38°C	Y / N / Unknown
Fever Onset	__/__/__ Time _____
Cough	Y / N / Unknown - If Yes: Productive / Non-productive
Difficulty Breathing	Y / N / Unknown
Headache	Y / N / Unknown
Myalgia	Y / N / Unknown
Rhinorrhoea (runny nose)	Y / N / Unknown
Sore Throat	Y / N / Unknown
Rigors	Y / N / Unknown
Vomiting	Y / N / Unknown
Diarrhoea	Y / N / Unknown
Conjunctivitis	Y / N / Unknown
Confusion	Y / N / Unknown
Other Symptoms	Y / N / Unknown - Details _____
CXR Performed?	Y / N / Unknown - If Yes, date performed __/__/__
Description of CXR Findings	_____
Other Abnormal Findings	_____
(e.g., white cell count, liver function)	_____

Laboratory					
Lab confirmed	Y / N	Specimen	_____	Specimen date/(s)	__/__/__ __/__/__
Organism	_____	ID method	_____		

Notification					
First notifier	_____	Telephone	_____	Fax	_____

Notifier type	<input type="checkbox"/> Lab	Notified date	__/__/__	Received date	__/__/__
No. in order of receipt	<input type="checkbox"/> Doctor				
	<input type="checkbox"/> Hospital (not lab)				
	<input type="checkbox"/> Other _____				
Treating doctor	_____	Telephone	_____	Postcode	_____
Address	_____			Fax	_____

Exposure History

Contact with an infectious human case of AI in 10 days before onset Y / N / Unknown

Date of last contact with a case? __/__/__

Provide details of contact _____
 (name, relationship, dates, duration, closeness of contact) _____

Contact with infected birds in 10 days before onset Y / N / Unknown
 (provide details in the *Travel History section below*)

Contact with AI laboratory samples in 10 days before onset Y / N / Unknown

Date of last contact with such samples? __/__/__

Travel History

1. ITINERARY

Please supply an itinerary of travel from 10 days before symptom onset to the present. Include visits to both AI-affected and AI-unaffected countries, dates of arrival and departure for each, and flight numbers.

Country Visited	Date & Time of Arrival	Flight Carrier & Number	Date & Time of Departure	Flight Carrier & Number

2. DETAILED HISTORY OF TRAVEL TO AI-AFFECTED COUNTRIES

Attach a separate page for each AI-affected country visited.

Name of Country _____ **Was it a Transit?** Y / N

If in transit, please specify details

Airport _____ Transit Date/s _____ Transit Time (hrs) _____

Did the case leave the airport during transit? Y / N

Did the case travel within the country? Y / N *If YES, detail all places visited*

Name of Place Visited	Contact with Poultry* (Y/N/U)	Type of Poultry Contact*	Date(s) of Poultry Contact

*e.g., visit to poultry market or poultry farm, residing in a village with large numbers of poultry, travelling on public transport with poultry

Reason for visit:

Business Y / N

Holiday Y / N

Visit family / friends Y / N

Other (specify) _____

If holiday, was the case on a tour? Y / N

If YES, name of tour and tour company _____

Dates travelled on tour _____ **to** _____

Other countries visited on tour _____

Hospital Admission History (in Australia)

Hospitalised Y / N / Unknown

Hospital Name _____

Date Admitted ___/___/___

Date Discharged ___/___/___

Treating Doctor Name _____ Position _____

Contact No. _____

Isolation Y / N / Unknown

If Yes, dates of period of isolation ___/___/___ to ___/___/___

ICU Admission Y / N / Unknown

If Yes, dates of ICU stay ___/___/___ to ___/___/___

Mechanical Ventilation Y / N / Unknown

Co-morbidities Y / N / Unknown **If Yes, specify** _____

Vaccination History

Previous Vaccination Y / N / Unknown

Against Influenza?

If Yes, most recent year?

Previous Vaccination Y / N / Unknown

Against Pneumococcus?

If Yes, most recent year?

Treatment Details

Antibiotics (please list)

(Include dates given)

Antivirals (please list)

(Include dates given)

Other (please list)

Outcome (circle all that apply)

Case Confirmed as AI	Y / N
Alternative Diagnosis Made?	Y / N If Yes, specify _____
If yes, was there supporting microbiological evidence?	Y / N / Unknown Details: _____
Case Recovered?	Y / N / Unknown
Case Died?	Y / N / Unknown
If yes, was an autopsy conducted?	Y / N / Unknown If yes, results: _____
Notes	_____ _____
Administration	
Completed by	Date finalised ___/___/___ PHU _____