



Avian Influenza in Humans

CDNA National Guidelines for Public Health Units

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

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1. Summary

This guideline outlines the public health response to humans with avian influenza virus infection, and people exposed to avian influenza virus through either infected birds, animals or humans, or contaminated objects and environments.

The Australian Veterinary Emergency Plan ([AUSVETPLAN](#)) outlines the nationally agreed response to emergency animal diseases including avian influenza in poultry, cage (aviary) or zoo birds in Australia. Detections of avian influenza in animals requires a One Health approach (see [section 3](#)), integrating the public health response to humans with [AUSVETPLAN](#) response strategies to avian influenza.

Avian influenza in humans (AIH) is a nationally notifiable disease and may be considered a listed human disease under the *Biosecurity Act 2015*.

The case definitions have been developed to apply to all avian influenza virus strains regardless of their pathogenicity classification in birds (see [section 3](#)). This recognises that any strain of avian influenza virus could emerge as a threat to human health.

This guideline does not relate to human pandemic influenza. If an avian influenza strain transforms into one that is easily transmitted between humans, it is no longer considered avian influenza, but becomes human (and possibly pandemic) influenza. Human pandemic influenza is described in the national and state/territory influenza pandemic management plans. The pandemic phases are outlined in the [Australian Health Management Plan for Pandemic Influenza](#) (AHMPPI) (1).

Note: While efforts have been taken to update this document to reflect emerging evidence, public health staff should review the latest literature when responding to avian influenza detections.

Public health priority

Urgent.

Respond to a suspected, probable and confirmed case of AIH immediately on notification, and commence identification of contacts from human sources and exposed persons from animal sources.

Immediately report details of the case to the relevant jurisdictional communicable diseases branch (CDB). The jurisdictional CDB should report probable and confirmed cases to the National Incident Centre the same day as notification.

Data entry should be completed within one working day.

Case management

Suspected, probable and confirmed cases of AIH should be isolated.

In a healthcare setting, suspected, probable and confirmed cases are to be isolated in a single occupancy room, preferably with negative pressure ventilation, or with the door closed if negative pressure is not available (2, 3). Do not use positive pressure rooms.

Standard and transmission-based precautions (contact and airborne) are to be used, in line with recommendations from the [Australian Guidelines for the Prevention and Control of Infection in Healthcare | Australian Commission on Safety and Quality in Health Care](#).

Minimum personal protective equipment (PPE) includes: gloves, impervious gown, eye protection and N95 / P2 face mask.

Cases are recommended to be treated with influenza antivirals (e.g. neuraminidase inhibitors), ideally within 48 hours of symptom onset.

Contact and exposed persons management

Contacts of AIH cases and people exposed to avian influenza via animals (including birds) or contaminated environments or items should be:

- rapidly identified
- counselled about their risk
- provided with verbal and written information on AIH
- placed under active or passive surveillance for 10 days after the last exposure
- recommended to receive the seasonal human influenza vaccine, noting this is a general recommendation for all people over 6 months of age
- provided with influenza antivirals (if indicated) (see [Section 13 – Post-exposure prophylaxis](#))
- if symptoms develop within 10 days of last exposure, be isolated and urgently tested (see [Section 13 – Symptomatic contacts](#)).

2. The disease

Infectious agent

Avian influenza is caused by influenza A viruses, which are subtyped by the antigenicity of their haemagglutinin (H) and neuraminidase (N) surface proteins. At present, 16 H subtypes and 9 N subtypes have been identified in birds (4). Although different subtypes have been reported in poultry, only H5, H7, and H9 have been detected in geographically diverse regions on a global scale, due to spread through wild bird migration (5).

Additionally, depending on the strain of avian influenza virus, other species, including mammals, can be susceptible to infection. See [About Influenza A in Animals | Influenza in Animals | CDC](#) for more information on avian influenza subtype detections in different animals, based off hemagglutinin and neuraminidase surface proteins.

Avian influenza viruses are classified into high pathogenicity avian influenza (HPAI) and low pathogenicity avian influenza (LPAI), determined by the molecular characteristics of the virus and its ability to cause disease and mortality in poultry (6). This classification only refers to the virulence of the avian influenza virus in birds and does not correlate with illness severity in humans.

Five avian influenza subtypes (H5, H6, H7, H9 and H10 viruses) are known to rarely cause infections in humans, with H5, H7 and H9 the most frequently identified (5). The Global Influenza Programme, World Health Organization (WHO), publishes monthly risk assessments and summaries of influenza at the human-animal interface (see [Global Influenza Programme \(who.int\)](#)).

Reservoir

Wild birds (e.g. ducks, geese, swans, shorebirds, waders and gulls) are the primary natural reservoir for avian influenza viruses. They can facilitate the spread of avian influenza viruses along migratory flyways across the world (7). Avian influenza viruses predominately affect birds, and all birds are thought to be susceptible to avian influenza (8).

Mode of transmission

Exposure pathways

Humans can be exposed to avian influenza via several exposure pathways including:

- **Inhalation:** inhaling virus particles present in the environment (e.g. excreta in contaminated dust particles or during aerosol generating activities such as culling poultry). Potential human-to-human transmission may occur during aerosol generating procedures that are likely to generate higher concentrations of infectious

respiratory particles (i.e. intubation) or behaviours that generate aerosols i.e. coughing and sneezing

- **Direct contact:** touching or handling infected animals or caring for infected humans without adequate PPE, and then touching mucous membranes (e.g. eye, oral or nasal mucosa)
- **Indirect contact:** touching or handling contaminated equipment, surfaces or the environment, and then touching mucous membranes
- **Ingestion:** consuming contaminated food items that have not been properly cooked or pasteurised. There is no evidence to suggest ingestion as a route of avian influenza infections for humans when food items have been properly cooked or pasteurised. Ingestion is thought to be a likely route of infection in carnivorous birds and mammals consuming infected animals (9-12).

Animals (including birds) to humans

Infected animals may shed virus in their respiratory secretions, faeces, and other bodily fluids depending on many factors such as the type of animal, the virus subtype and the presence of other diseases.

Most cases of AIH have been related to exposure to infected live or dead poultry. Slaughtering, defeathering, handling carcasses and their products (e.g. faeces of infected birds can contain large amounts of virus) (13), and preparing infected poultry for consumption, especially in household settings, are also likely to be risk factors.

Avian influenza is not well adapted to mammals. However, spread of HPAI A(H5N1) clade 2.3.4.4b has occurred since 2021 with increased reports of non-human mammal-to-mammal transmission (see [Section 3 - AI in mammals](#)). This relates to mutations that enhance polymerase activity, replication in mammalian cells, evasion of immune response and increased virulence in mice experimentally. These mutations may increase the risk of potential mammal-to-human transmission (14).

Foodborne transmission

There is no evidence to suggest consumption of properly cooked or pasteurised food products, including poultry, eggs, beef, or milk, can transmit avian influenza viruses to humans (15). There is documented evidence of AIH A(H5N1) human cases being linked to the ingestion of uncooked poultry products (raw blood) (16).

The Food Standards Australia and New Zealand (FSANZ) provides up to date information on food safety related to AIH (see [Animal diseases, human health and food safety | Food Standards Australia New Zealand](#)).

Environmental exposure

Environmental exposure in settings such as live animal markets and poultry farms has been associated with cases. Additionally, environmental exposure through contaminated water (e.g. swimming or bathing in contaminated ponds), as well as exposure to

contaminated faeces in fertilizer, has been suggested as a possible risk factor for AIH infection in some studies (17-21).

Avian influenza viruses can persist for extended periods in water, faeces and the environment. Environmental factors including humidity, UV exposure and temperature affect the survivability of avian influenza viruses ([Section 14 - Environmental evaluation and management](#)).

Human-to-human transmission

There is limited evidence for human-to-human transmission of avian influenza viruses, and when it has occurred it has been related to prolonged, unprotected close contact with a human case (22, 23). To date, sustained transmission has not been identified in currently circulating avian influenza viruses (24). If avian influenza viruses gain the ability for sustained transmission in humans, the virus is no longer classified as AIH but becomes human (and possibly pandemic) influenza.

Incubation period

There is documented evidence of the AIH incubation period ranging from 1 to 10 days, with a mean of 3.4 days and 95% of infections developing symptoms within 6.5 days (25-27). For public health purposes, the incubation period is 10 days.

Evidence indicates that the incubation period for AIH may be longer than that for normal seasonal human influenza, which is around two to three days. Additionally, the incubation period for AIH can vary depending on the subtype.

In the event there is evidence to support that an AIH subtype infection has a longer incubation period, then the longer incubation period should be applied for public health purposes.

Infectious period

The exact infectious period of an AIH infection is not clearly defined, as there has been no sustained human-to-human transmission documented to date (24).

For public health purposes, based on available evidence from AIH (22, 28-37) and seasonal human influenza infections (38-41), people should be considered infectious from 1 day before symptom onset until 7 days after symptom onset or until acute symptoms resolve, whichever is longer.

In the event where an avian influenza strain develops the ability to cause human-to-human transmission, the infectious period should be re-evaluated based off available evidence.

Long term shedding of virus has been reported, particularly among children and those with severe disease or immunosuppression (40, 42-48). The possibility of long-term viral shedding should be considered on a case-by-case basis in consultation with infectious diseases specialists / microbiologists.

Antiviral treatment has been shown to reduce viral shedding in AIH and seasonal influenza cases (43, 44, 47, 49). However, the low number of secondary cases detected indicates that viral shedding is unlikely to be an accurate reflection of AIH infectivity whilst there is an absence of sustained transmission amongst humans.

Clinical presentation and outcome

The clinical presentation of AIH can be highly variable both between and within haemagglutinin subtypes.

Globally, the overall case fatality rate for A(H5N1) subtype virus infections amongst humans from 1 January 2003 to 3 May 2024 was 52% (50). However, all detected cases in the United States from 1 April 2024 to 31 July 2024 experienced mild symptoms (51), indicating specific A(H5N1) clade 2.3.4.4b (subvariant B3.13) may have a lower case fatality rate. The case fatality rate for A(H7N9) subtype virus infections among humans has previously been reported to be 40% (52).

As with seasonal human influenza, a person infected with AIH 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, nausea and vomiting may also occur (13).

Conjunctivitis, with or without other typical influenza symptoms, has been a notable clinical sign associated with some avian influenza subtypes. AIH should be considered in any person who has had close exposure to animals infected with any subtype of avian influenza and who presents with conjunctivitis or other mild symptoms, such as gastrointestinal symptoms (13, 53).

Persons at increased risk of infection

The likely scenarios in which a AIH could occur in Australia are:

- a person is infected in Australia after close contact with infectious material from infected birds or mammals
 - those at highest risk of these exposures are commercial poultry workers who work directly with potentially infected poultry
 - other groups at higher risk of exposure include agricultural workers, veterinarians, and associated occupations involved in depopulating poultry farms or working with or handling potentially infected animals or their products, including wildlife workers, volunteers and people who work in Environmental Health in remote communities (e.g. Aboriginal Environmental Health Workers). This risk may increase for people with exposure to a mass animal die-off event
 - people who own birds may also be at increased risk

- a person is infected overseas after close contact with infectious material from birds, mammals 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
- people who hunt and subsequently handle or butcher wild birds may be at increased risk of exposure in certain circumstances, and may include Aboriginal and Torres Strait Islander people (see [Aboriginal and Torres Strait Islander populations](#)).

Persons at increased risk of severe disease

People who may be at greater risk of severe illness from avian influenza virus include:

- people with immunocompromising conditions, including cancer and cancer treatments, bone marrow transplants, solid organ transplants, severe autoimmune conditions, congenital or acquired immunodeficiency (e.g. human immunodeficiency virus (HIV) with CD4 count <200 cells/microlitre), and people receiving potent immunosuppressive agents (e.g. high-dose corticosteroids)
- pregnant people and postpartum people (up to 6 weeks) (13)
- children
- people over 65 years of age
- Aboriginal and Torres Strait Islander people.

Disease occurrence in humans and public health significance

AIH is rare, and human-to-human transmission is even less common. When human infection has occurred, it has usually been linked to infected birds, infected animals or highly contaminated environments, such as poultry farms, wild birds or live animal markets.

From January 2022 through June 2024, 29 sporadic human cases of A(H5N1) were reported from nine countries, including 15 cases of severe or critical illness, and seven deaths, six cases of mild illness, and eight asymptomatic cases (54). Severe illness has also been observed in H7N9 subtypes (53, 55).

People or animals co-infected with avian influenza and another influenza virus 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 (56).

Aboriginal and Torres Strait Islander populations

Aboriginal and Torres Strait Islander people share an interconnected relationship with Country, which includes their connection to animals and totems. Any preventative messaging on avoiding wildlife needs to be carefully co-developed in collaboration with community. In the event of detection of avian influenza subtypes in Australia that are

associated with mass mortality events in wildlife, Aboriginal and Torres Strait Islander people may experience additional psychosocial impacts from the significant loss of animals.

Aboriginal and Torres Strait Islander people are at increased risk of transmission and poorer health outcomes from avian influenza infections due to a number of intersectional factors that may increase risk, including:

- Aboriginal and Torres Strait Islander people on Country may have greater exposure risk to avian influenza infected animals when undertaking customary activities including hunting or handling wild birds
- environmental exposure may be a risk factor, for example, contamination of water supply in remote communities by infected wild birds or exposure when swimming in contaminated water bodies
- Aboriginal and Torres Strait Islander people and communities' relationships with animals (e.g. companion animals) that may be susceptible to avian influenza from wild animals
- a high prevalence of medical conditions that may place individuals at risk for severe disease from avian influenza
- lack of adequate housing and home health leading to crowded housing and environmental conditions that may facilitate disease transmission and difficulties with isolation
- occupations (e.g. Aboriginal Environmental Health Workers, Indigenous Rangers Program) in regional areas that both interact with animals and animal products at higher frequency
- barriers to accessing appropriate and timely healthcare, including limited access to culturally appropriate healthcare, institutional racism, mistrust of mainstream health services and remoteness.

In the event of avian influenza virus adaptation to human transmission, Aboriginal and Torres Strait Islander people may be disproportionately impacted, as was observed in the 2009 H1N1 pandemic. In this pandemic, Aboriginal and Torres Strait Islander people had higher H1N1 notification rates, experienced an increased risk of hospital and intensive care admission, and had higher mortality rates, than non-Indigenous people (57-65).

Jurisdictional health agencies should partner with Aboriginal and Torres Strait Islander people and communities to ensure avian influenza response plans, activities, communications and outbreak responses are relevant, culturally safe and effective in the context. This includes considerations of the impact to Aboriginal and Torres Strait Islander people and communities based on the interconnectedness between Aboriginal and Torres Strait Islander people working in industry or with wildlife.

Responses to AIH cases, contacts or exposed persons in Aboriginal and Torres Strait Islander people or communities should be co-led by relevant public health agencies as well as representatives from a local Aboriginal Community Controlled Health Service (ACCHS) where possible, to ensure that responses are culturally safe. Co-designed

approaches should be central to any community-based response and should continue from planning and implementation through to evaluation to ensure actions are culturally appropriate. Additionally, involvement of ACCHS' when managing Aboriginal and Torres Strait Islander cases, contacts or exposed persons can help ensure culturally appropriate psychosocial support is available to those affected. Any information on disease risk needs to be contextualised and communicated in a culturally safe manner so individuals and families understand the importance of any recommendations to cases, contacts, exposed persons and the potential need for contact tracing. Culturally appropriate educational resources should be co-designed for the local context.

3. One Health

One Health recognises that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent (66).

Avian influenza is primarily a disease of birds but is also a zoonosis with the potential to become a significant human disease, including a pandemic influenza strain. It is therefore essential to adopt a One Health approach when responding to the health challenges posed by avian influenza. Additionally, avian influenza is classified as an emergency animal disease and is covered under animal biosecurity legislation and plans.

Appropriate federal and jurisdictional emergency management arrangements and structures apply.

The cross-sectoral collaboration between relevant agencies, characteristic of a One Health approach, is key to ensuring effective communication and coordination of preparedness and response to avian influenza risk or outbreaks of disease. Efforts should include quality surveillance in both animal (including wild birds) and human populations that inform collaborative public health measures. Additionally, avian influenza detections in animals require a risk assessment to categorise the human health risk in people exposed to infected animals. Where AIH cases occur, public health agencies should conduct a thorough investigation of the source of infection to manage the risk to contacts and inform risk-based pandemic planning activities.

A One Health approach emphasizes the shared partnership and collaboration between human, animal and environmental health agencies to control health threats, for which effective information sharing across all sectors is essential. In these guidelines, jurisdictional agencies responsible for animal health, including the surveillance and control of avian influenza in domestic and wild birds and other animals, are referred to collectively as animal health agencies. Animal health agencies should involve human health authorities in human risk assessment and control following detections of avian influenza in animals. Jurisdictional CDBs must also notify the jurisdictional animal health agencies of any human cases for investigation of possible zoonotic sources, risk to poultry or risk to other animals.

Avian influenza in animals

Avian influenza in birds and poultry

Almost all LPAI subtypes (H1-16, excluding H14) have been detected in Australian wild birds (67) and typically cause no sign of disease or mild illness (68). Migratory wild birds are important in the geographical spread of avian influenza and pose the greatest risk of new subtypes of avian influenza incursions into Australia (see [Section 3 - Threat and vulnerability](#)) (7).

Poultry flocks are particularly susceptible to avian influenza viruses and can facilitate mutations of the virus as it passes readily through large number of birds (8, 67). Some specific LPAI subtypes (i.e. H5 and H7) can mutate into HPAI viruses following outbreaks in wild birds or spillover from wild birds to domestic and commercial poultry (e.g. when poultry comes in contact with wild birds such as in free-range production practices). HPAI viruses typically cause severe disease and high mortality in infected bird populations, with mortality rates up to 90 to 100% in poultry (4). The [AUSVETPLAN](#) outlines clinical signs of LPAI and HPAI amongst birds. Additionally, the spillback of HPAI strains from poultry into wild birds can contribute to the further spread of HPAI (68).

Since 2003, clades of A(H5N1) have spread in birds from Asia to Europe and Africa, and to the Americas in 2021, and are now endemic in wild birds in many countries. Millions of poultry infections, several hundred human cases, and many human deaths have occurred (69-72). Human cases have been reported mostly from countries in Asia, but also from countries in Africa, the Americas and Europe (54, 73). In 2020, a new clade of A(H5N1) known as 2.3.4.4b emerged in Europe. With high levels of infectivity and pathogenicity, the 2.3.4.4b clade of HPAI A(H5N1) has become panzootic, spreading globally to all continents except Australia (as of July 2024). It has been the key driver of increases in the frequency and geographic distribution of HPAI outbreaks in poultry and wild birds and spillover to mammals has occurred (67).

The National Avian Influenza Wild Bird Surveillance Program (see [Wild Bird Surveillance \(wildlifehealthaustralia.com.au\)](https://wildlifehealthaustralia.com.au)) undertakes surveillance activities of avian influenza in wild birds across Australia.

Avian influenza in mammals

While infrequent, avian influenza can spill over into other species including both terrestrial and marine mammals. There have also been instances of mammal-to-mammal transmission with some subtypes of avian influenza, and some avian influenza subtypes have eventually become endemic amongst swine, canine and equine species (74-77).

In late 2021, HPAI A(H5N1) clade 2.3.4.4b was detected in North America and initiated an outbreak that continues into 2024. Spillover detections, mammal-to-mammal transmission and mass mortality events from this clade have been reported in both terrestrial and marine mammals across the globe. Recent research indicates mammal-to-mammal spread of A(H5N1) was a factor in mass mortality events of sea lions and elephant seals in South America (78). A(H5N1) has also been confirmed in marine mammals in Antarctica (79). The World Organisation for Animal Health reports cases of HPAI in mammals (see [Avian Influenza - WOA - World Organisation for Animal Health](#)).

In 2024, the United States reported cow-to-cow transmission of A(H5N1) clade 2.3.4.4b (sub-variant B3.13) in dairy cattle, which resulted in a multi-state cattle outbreak. Human cases of A(H5N1) in dairy farm workers were attributed to exposures to dairy cattle (54). Evidence of multidirectional interspecies transmission within affected dairy farms has also been observed (i.e. transmission from dairy cattle to birds, domestic cats, and

raccoons) (80). Additionally, where the B3.13 sub-variant has spilled back from dairy cattle to nearby poultry populations, workers involved in de-population activities of poultry (and not the dairy cattle) have become infected with the virus (51).

The detection of HPAI A(H5N1) clade 2.3.4.4b virus has been associated with severe cases of human disease, which raises further concerns regarding the pandemic potential of specific HPAI viruses (54, 81).

Avian influenza in poultry in Australia

A number of commercial poultry farm outbreaks have occurred in Australia. HPAI H7 (2012 and 2013) (82, 83), LPAI H4 and LPAI H9 (2012) and LPAI H10 (2010) (84, 85) subtypes have been recorded in New South Wales. Only the LPAI H10 subtype was associated with recognised likely transmission of mild illness to humans (85). An LPAI H5 outbreak also occurred in a Victorian duck farm in 2012 (84). In 2013, a LPAI H5N3 detection occurred in Western Australia. In 2020, three different strains of avian influenza were identified in Victoria, including HPAI H7N7 and LPAI H5N2 and H7N6 (86). During 2024, there have been a number of avian influenza detections in commercial and backyard poultry in Australia in multiple jurisdictions including HPAI H7N3 and HPAI H7N9 in Victoria, HPAI H7N8 in New South Wales and the Australian Capital Territory and LPAI H9N2 in Western Australia (87). See the [AUSVETPLAN](#) for more information on detections of avian influenza in commercial poultry in Australia.

The increase in avian influenza poultry outbreaks in Australia in 2024 is considered to relate to increased circulation of avian influenza virus in wild birds, spillover into poultry, and environmental factors that drive the spread of avian influenza amongst wild birds such as increased wet conditions.

Threat and vulnerability

Various strains of avian influenza virus are enzootic in bird populations around the world. Outbreaks in Australian domestic poultry have been associated with poor biosecurity, increased biosecurity risks due to free-range practices, confirmed or circumstantial evidence of contact with waterbirds, or inadequately treated surface water potentially contaminated by waterbirds or domestic ducks (68). Avian influenza virus-contaminated materials carried by humans or material brought into Australia from avian influenza virus-infected countries may also pose a risk of infecting poultry or humans.

The Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) commissioned a risk assessment on the likelihood and consequence of HPAI A(H5N1) clade 2.3.4.4b incursions into Australia via wild birds with establishment in wild birds, poultry or wild mammals, using information available as of 20 July 2023 (88). The risk assessment characterised the overall risk to Australia as:

- **High risk** of incursion and establishment in wild birds, moderate uncertainty
- **Moderate/High risk** of entry and establishment within poultry, moderate uncertainty
- **Low risk** of entry and establishment with wild mammals, high uncertainty.

Since the report was published in December 2023, the HPAI A(H5N1) clade 2.3.4.4b has spread from South America onto the Antarctic continent. Thousands more wild birds and marine mammals have been infected, and a considerable number of scientific studies have been published addressing the ecology, evolution, virology, pathogenicity of this clade. This highlights the dynamic nature of the current global avian influenza situation, increased risk of incursion of HPAI A(H5N1) clade 2.3.4.4b in Australia and the need to evaluate evidence as it emerges to enhance risk mitigation strategies (89).

Risk mitigation

Biosecurity measures have been put in place in many commercial bird facilities to minimise the risk of future avian influenza infections in birds (e.g. [Farm Biosecurity](#)). However, many facilities (notably free-range poultry farms) may present opportunities for exposure of poultry to wild birds and/or their excretions. Similarly, domestic birds housed outdoors may also be in contact with wild birds and/or their secretions.

Additionally, other biosecurity recommendations and guidelines are available to support biosecurity practices to manage infectious disease risk in wildlife, domestic animals and humans (e.g. [Biosecurity & Management \(wildlifehealthaustralia.com.au\)](#), [Biosecurity \(zooaquarium.org.au\)](#) and [Australian Veterinary Association | Personal Biosecurity \(ava.com.au\)](#)). Wildlife Health Australia have produced a [HPAI and Wildlife in Australia Risk Mitigation Toolbox for Wildlife Managers](#), which outlines guidance on developing plans to mitigate risk of HPAI in wild birds as well as wild mammals.

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 avian influenza in Australia. These procedures are outlined in the [AUSVETPLAN](#).

4. Routine prevention activities

The prevention of AIH in Australia principally relies on:

- In healthcare settings, implementation of standard and transmission-based precautions. Refer to [Section 10. Infection Prevention and Control](#).
- Good workplace health and safety practices for anyone working with potentially infected animals, contaminated objects and environments (See [Appendix E](#)).
- Community awareness regarding risks associated with avian influenza and need for strategies such as adequate hand hygiene after handling animals and uncooked meat or animal products (including eggs); and ensuring that meat and animal products are cooked thoroughly before eating. FSANZ provides advice on food safety (see [Food safety basics | Food Standards Australia New Zealand](#))
- Advice to travellers to avoid contact with unwell and deceased animals, poultry farms and live bird “wet” markets (90). [Homepage | Smartraveller](#) provides travel-related advice.
- Active surveillance by health authorities of people at known elevated risk of avian influenza, such as workers associated with avian influenza outbreaks in poultry or wild birds, to ensure the earliest possible detection of spillover events. Rapid identification of spillover of avian influenza to humans supports effective response measures to protect the health of exposed persons and contain the spread of avian influenza to other people.

The [Australian Immunisation Handbook \(health.gov.au\)](#) recommends that all people aged ≥6 months receive the annual seasonal human influenza vaccine every year. Although the seasonal influenza vaccination does not prevent infection with avian influenza virus, it will help reduce the risk of co-infection, genetic viral re-assortment, and a potential pandemic (91). Therefore, [people who are at increased risk of infection from avian influenza](#) should be recommended to receive the annual seasonal human influenza vaccine, ideally administered two weeks before any potential exposures.

5. Surveillance objectives

1. Monitor the epidemiology of avian influenza virus in Australia using a One Health approach that integrates animal, environmental and human surveillance.
2. Assess the risk to humans from exposure to avian influenza infected birds or other animals and identify, counsel and provide infection prevention advice to people exposed to avian influenza infected animals.
3. Rapidly identify AIH cases to enable isolation, correct use of PPE if hospitalised and treatment and prevent transmission to their contacts.
4. Rapidly identify human contacts to enable public health management.
5. Detect human cases, instances of human-to-human transmission or clusters of human cases, that may indicate viral adaptation.
6. Understand the epidemiology (including virology) and clinical characteristics (including severity and mortality) of AIH in Australia and globally, in order to identify risk factors and prevent transmission.

6. Data management

Within one working day of notification, enter confirmed and probable cases on state or territory notifiable diseases database.

7. Communications

Any suspect or confirmed avian influenza infections in birds or other animals should be reported to the jurisdictional CDB by the jurisdictional animal health agency to assess the risk of infection in human contacts and initiate active public health and surveillance measures as appropriate.

Immediately report suspected, probable and confirmed cases of AIH 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 (contacts and people co-exposed) and follow up actions taken.

The jurisdictional CDB should immediately notify probable and confirmed AIH cases to the National Incident Centre and the jurisdictional animal health agency.

8. Case definition

Avian Influenza in Humans (AIH) Case Definition

Reporting

Both confirmed cases and probable cases should be notified to the Nationally Notifiable Disease Surveillance System.

Suspected cases should not be notified to the Nationally Notifiable Disease Surveillance System.

Case definitions

For AIH case definitions, please see [CDNA surveillance case definitions | Australian Government Department of Health and Aged Care](#).

9. Laboratory testing

Recommended testing methodologies for Influenza A (includes avian influenza) can be found in the [Public Health Laboratory Network \(PHLN\) laboratory case definition for influenza](#). [Specific advice from the microbiologist at the testing laboratory may be sought to obtain advice on specimen collection, safe packaging and transport.](#)

Patient referral and a request for an avian influenza test should occur after clinical consultation with:

- jurisdictional public health authorities or
- a specialist microbiologist or infectious diseases physician.

Laboratory diagnosis and confirmatory testing should be urgently sought for all suspected AIH cases (see [Section 8. Case definition](#)) that meet epidemiological criteria and clinical criteria.

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 laboratory personnel. Additional information including travel history, clinical severity (including details of hospitalisation and intensive care unit admission if relevant), and preliminary pathology results (e.g. influenza A PCR positive – not yet subtyped) should be included on pathology forms to help laboratory risk assessments and prioritisation.

Appropriate PPE should be worn during sample collection (see [Section 10. Infection prevention and control](#)).

Specimens used for testing

Specimens collected for AIH testing are similar to those used for seasonal influenza. This may include respiratory tract specimens (combined nasopharyngeal swab or nose and throat swabs are the recommended sample). Additional non-respiratory specimens, (e.g. conjunctival swabs, serum, faeces, rectal swabs and cerebrospinal fluid) may be useful in diagnosing some cases where the spread of influenza is more systemic (e.g. A(H5N1)) or localised at a non-respiratory site. For example, a conjunctival swab should be taken if there is conjunctivitis present or evidence of an eye infection. Influenza A(H5N1), A(H7N7) and other influenza A subtypes may be detectable from eye swabs. Lower respiratory tract samples may also be tested in suspected cases of severe influenza virus infection (e.g. A(H5N1), A(H5N6), A(H7N9)) when testing of the upper respiratory tract returned a negative result. See the [Public Health Laboratory Network \(PHLN\) laboratory case definition for influenza](#) (page 11, section 3.6) for more information on specimens.

Swabs may be flocked (nylon), cotton, rayon or dacron-tipped, plastic-coated or aluminium shafted. They either contain their own viral transport media (VTM), Universal Transport Medium (UTM) or can be placed into a vial of VTM/UTM immediately after collection.

Influenza serology may be useful to determine if the person has been infected with avian influenza, especially if the person is asymptomatic. If seroconversion is confirmed, this is likely to indicate a true infection. Ideally specimens used for serology testing would involve an acute serum sample taken at the time of infection or at symptom presentation and then a convalescent serum sample 4 to 6 weeks later. The second sample is needed to confirm that seroconversion has occurred but is not needed for patient treatment decisions. If the person presents with respiratory symptoms, serological testing may not be needed. If a person has a positive nucleic acid test (NAT) for highly pathogenic avian influenza A virus, is asymptomatic and does not seroconvert, this may indicate environmental carriage of viral RNA rather than a true infection and the positive NAT may have been due to high viral loads in the environment, for example, when poultry culls are occurring. Jurisdictions may consider the collection of paired sera for asymptomatic contacts to support greater understanding of human transmission risk, however, asymptomatic serology is not advised for diagnostic identification. Samples should be referred to the World Health Organization Collaborating Centre for Reference and Research on Influenza (WHO CCRI).

A risk-based approach may be taken for testing suspected cases in healthcare settings to balance the risk of accessing a negative pressure room with reducing exposure to staff and patients. To minimise the risk of exposure of staff and patients within facilities, testing may be arranged in alternative places such as open-air environments (e.g. carparks of clinics), where clinically appropriate with regards to patient care needs. Additionally, domiciliary testing should be considered, where appropriate with regards to patient care needs, to minimise risk of exposure of staff and patients in healthcare facilities.

For cases, where the pre-test suspicion of AIH is high (e.g. suspect cases who have severe illness, are contacts of human cases and/or where there has been evidence of human-human transmission), specimen collection should occur in a negative pressure room, by healthcare workers (HCWs) wearing appropriate PPE. Write on specimen forms and containers before entering the patient's room to collect the specimens. Where the pre-test suspicion of AIH is lower, specimens could be collected in a single room with the door closed or, if appropriate, outdoors or at the patient's residence, by HCWs wearing appropriate PPE.

Use of rapid antigen tests (RATs) are not recommended for the purposes of diagnosing AIH, especially for novel influenza strains. RATs have not been evaluated extensively for testing non-seasonal influenza and are likely to be less sensitive than nucleic acid testing, and therefore a negative test may not exclude avian influenza.

Specimen handling

HPAI viruses infecting humans are considered Security Sensitive Biological Agents (SSBA) and are regulated under the [SSBA Regulatory Scheme](#). The SSBA regulatory scheme applies to animal and human health laboratories. The associated regulatory SSBA requirements for handling of a sample do not commence until a suspicion has been formed based on a presumptive laboratory-based test (such as a positive detection

on an assay that includes a H5 target or whole genome sequencing). It is important that appropriate biosafety and SSBA guidelines are followed when culturing and processing influenza positive samples (See [Australian/New Zealand Standard, Safety in laboratories Part 3: Microbiological aspects and containment facilities](#)).

Testing and genetic analysis

Human samples should be tested for avian influenza at a National Association of Testing Authorities (NATA)/Royal College of Pathologists of Australasia (RCPA) accredited laboratory, as outlined in the [Public Health Laboratory Network \(PHLN\) laboratory case definition for influenza](#) (page 11, section 3.6).

As AIH is often an unlikely diagnosis in most suspected cases, other relevant tests should be requested concurrently along with collection of other relevant clinical history (such as exposure, travel history and symptoms) to identify an alternative diagnosis.

In order to reduce specimen handling and expedite results from public health reference laboratories, jurisdictions should implement clear pathways for collection and testing of specimens that are clinically suspected to be avian influenza. Where public health laboratories are not readily available, this may involve an initial screen for influenza A by any laboratory using current commercially available influenza A tests with referral to a National Influenza Centre or the WHO CCRI if positive for confirmation of the positive result and further subtyping and characterisation.

Genomic characterisation of a virus is a key part of monitoring evolution and transmission of avian influenza virus between different species and amongst human cases. The [Communicable Diseases Genomics Network](#), an Expert Reference Panel of the PHLN, provides technical advice and guidance on genomic testing and surveillance strategies.

The Department of Health and Aged Care funds the WHO CCRI which obtains, preserves and characterises influenza virus strains – work that contributes to monitoring for cases of influenza viruses with pandemic potential.

Several Australian public health reference laboratories provide data to the WHO Global Influenza Surveillance and Response System (GISRS). This supports the monitoring of advanced antigenic shifts and drift, and for advanced genetic analysis.

10. Case management

Following a report of a case (confirmed or probable) of AIH, a public health response must be implemented to respond to the potential avian influenza risk to human health. An expert panel should be convened by the jurisdictional CDB to inform the public health response.

The expert panel may include experts in public health including public health physicians, and epidemiologists, human influenza experts, infectious disease physicians, microbiologists or virologists, and infection control professionals. The response should aim to undertake a risk assessment, identify all contacts that have been exposed, review their exposure level and categorise them based on their contact risk to ensure they are managed accordingly.

Response times

Immediately on notification of a suspected case of AIH, begin follow up investigation and notify the jurisdictional CDB.

For confirmed and probable cases, complete the “Avian Influenza in humans (AIH) - Investigation Form” (see [Appendix D – Avian Influenza in Humans – Investigation form](#)) and transfer the data to the jurisdictional CDB notifiable disease database on the same day.

Response procedure

Case investigation

The response to a notification will normally be carried out in collaboration with the case’s healthcare team. Regardless of who does the follow-up, for probable and confirmed cases, public health unit (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 (if the patient is in the community, there is a preference for domiciliary collect of specimens, if appropriate, to reduce exposure to others); laboratories should be advised before sending the specimens.
- if required, contact the treating doctor (e.g. for cases admitted to hospital) to find out if the case or relevant caregiver has been informed of the diagnosis before contacting the case and beginning the interview
- provide information to the case about AIH infection
- review case management
- identify any contacts, determine contact risk and undertake relevant contact management

- ensure appropriate infectious disease and infection prevention and control professionals are notified and infection control policies are available to those caring for the case in a healthcare setting
- identify the likely source of infection, including identifying any exposure to poultry, livestock, wild birds, domestic pet birds or other animals
- obtain a travel, occupational and recreational history, and follow up clinical results and case details
- identify anyone who may have been co-exposed to the case's infection source and manage accordingly.

See [Appendix C - Avian Influenza in Humans – Public Health Unit checklist](#) and [Appendix D – Avian Influenza in Humans – Investigation form](#) for a case investigation checklist and form.

Note. If interviews with suspected, probable or confirmed cases are conducted face-to-face, the person conducting the interview must have a thorough understanding of infection prevention and control practices, be competent in using appropriate PPE (which includes gloves, impervious gown, eye protection and N95 / P2 face mask including the use of a fit tested and fit checked respirator – see recommendations from the [Australian Guidelines for the Prevention and Control of Infection in Healthcare | Australian Commission on Safety and Quality in Health Care](#)), and have been vaccinated with the current seasonal human influenza vaccine.

Case treatment

Treatment of a case is the responsibility of the treating clinician in consultation with specialist input such as infectious diseases, virology or microbiology.

Influenza antiviral treatment is recommended as soon as possible for suspected, probable or confirmed cases of human infection. Evidence suggests that neuraminidase inhibitors (e.g. oseltamivir or zanamivir) is associated with reduced mortality in people with A(H5N1) infection for up to 5 days (ideally commenced within 48 hours) from the onset of illness (1, 47). There is currently no clinical experience with use of baloxavir to treat AIH. It may be considered where there is resistance to neuraminidase inhibitors.

Education

Provide the *Avian Influenza in Humans Fact Sheet* ([Appendix A](#)) to cases so cases are aware of the signs and symptoms of AIH, the requirements of isolation, need for contact tracing, contact details of the PHU and the infection control practices and precautions that can prevent the transmission of AIH.

Isolation and restriction

Cases should isolate until 7 days after symptom onset or until acute symptoms resolve, whichever is longer.

Cases who are severely immunocompromised may experience longer infectious periods, and isolation recommendations should be considered on a case-by-case basis.

When in a healthcare setting, advice from the facility's infectious disease and infection prevention and control units should be sought. Ideally, cases should be managed (2, 3) in negative pressure rooms, however, patients may be cared for in single occupancy rooms following a risk assessment of likely infectivity, availability of negative pressure rooms and other mitigating measures (e.g. PPE, high efficiency particulate air (HEPA) filtration). Do not use positive pressure rooms. Also consider source control and if clinically appropriate, the patient should be asked to wear a surgical mask when required e.g. during transport and other potentially high risk situations.

Infection prevention and control

Standard and transmission-based precautions (contact and airborne) (1) should be used in healthcare settings (including hospital-based, community and primary care) in line with recommendations from the [Australian Guidelines for the Prevention and Control of Infection in Healthcare | Australian Commission on Safety and Quality in Health Care](#) (2, 3). PPE should include N95 / P2 face mask, eye protection, impervious gown and gloves.

Also refer to the ACSQHC Hierarchy of Controls recommendations (see [Use of the hierarchy of controls in infection prevention and control – Fact sheet | Australian Commission on Safety and Quality in Health Care](#)).

Healthcare professionals caring for human AI cases should have received the current annual seasonal human influenza vaccine.

Active case finding

Where a source is suspected, either from infected birds or animals, or more rarely from another human, PHUs should actively search for other cases in people who were exposed and monitor for symptoms in these people for 10 days following last exposure.

11. Environmental evaluation

Where transmission of avian influenza is suspected, a thorough review of contributing environmental factors should be performed, applying One Health principles.

If healthcare associated infection is suspected, the adequacy of infection control procedures must be reviewed rapidly.

If transmission is suspected to be animal-related, the environmental assessment should include a review of the potential mechanisms for exposure to infected animals, in collaboration with jurisdictional animal health agencies and the jurisdictional work safety authority (see [Section 14 – Environmental evaluation and management](#)).

Staff conducting the environmental evaluation must have a thorough understanding of infection control practices, be competent in using PPE, including the safe use of face masks (e.g. fit tested and fit checked) and have been vaccinated with the current human influenza vaccine. They must follow standard and transmission-based precautions (contact and airborne), including appropriate use of PPE (gloves, impervious gown, eye protection and N95 / P2 face mask) in line with recommendations from the [Australian Guidelines for the Prevention and Control of Infection in Healthcare | Australian Commission on Safety and Quality in Health Care](#) or [Appendix E](#).

12. Contact definitions

Sections 12 and 13 relate to advice for management of human contacts of a human case of avian influenza. See [Section 14](#) for advice relating to human exposure events to infected animals and contaminated environments.

Identification of contacts

Avian influenza virus can be transmitted to people from inhalation of aerosolised particles or contaminated dust, and direct and indirect contact with infected human cases and animals including birds (see [Section 2. Mode of transmission](#)).

From available evidence, most human infections have been related to exposure to high viral loads in animals where PPE was not used.

Contact definitions

The contact definitions in [section 12](#) relate to exposure to a confirmed or probable AIH case.

The evidence for defining what constitutes “contact” with a case is limited. Where human-to-human transmission has occurred, it has been associated with close and prolonged contact with an infectious case.

The contact definitions may be adapted by jurisdictions depending on a risk assessment, advice from the jurisdictional expert panel and any additional information that may become available on the specific avian influenza virus strain. Prioritisation of contacts and contact tracing may need to be considered depending on the number of contacts.

Contact risk assessments and advice from the expert panel should take into consideration factors such as:

- activities undertaken by the case and contacts
- duration, proximity and setting (i.e. indoors or outdoors) of contact
- pathogenicity, subtype or clade (if known) of the avian influenza virus, including evidence of ability to cause severe human disease, and
- typical PPE used by the contact and/or case, including if any PPE breaches. PPE use should be assessed against each recommended PPE item (gloves, impervious gown, eye protection and N95 / P2 respirator) (see [section 10](#) for more information), as well as PPE training including competency in donning and doffing.

Additionally, contacts should be assessed for any individual risk factors for severe disease (see [Section 2. Persons at increased risk of severe disease](#)).

Contacts of human cases

Table 1: Contact definitions and examples

Contact type	Definition	Examples
High risk contact	- Close^[1] and prolonged^[2] and unprotected contact with a human case (confirmed or probable) OR - Household or household-like contacts - OR - Unprotected contact with infectious secretions or bodily fluids or laboratory specimens of a human case (confirmed or probable) OR - Unprotected exposure to aerosols from respiratory secretions of a human case (confirmed or probable) (e.g. conducting procedures involving oropharynx) OR - Other high risk contacts (based on risk assessment) as determined by the expert panel	Members of the household, including overnight visitors Sexual or intimate partners Healthcare workers present during an aerosol-generating procedure without appropriate PPE[5] Healthcare workers who provided prolonged[2] care to a human case (confirmed or probable) without appropriate PPE[5] Laboratory workers who performed tests on a specimen from a human case (confirmed or probable) without appropriate PPE[5] Visitors of a human case (confirmed or probable) for a prolonged[2] period without appropriate PPE[5] Persons sitting in seats within two rows of a human case (confirmed or probable) on an aeroplane for a prolonged time, without appropriate PPE[5] Persons sharing a vehicle for a prolonged[2] time with a human case (confirmed or probable) without appropriate PPE[5]
Low risk contact	People with close^[1] and short^[3] and unprotected	Healthcare workers with a short period of PPE breach, or

Contact type	Definition	Examples
	contact with a human case (confirmed or probable) during their infectious period OR People with short and unprotected contact in an enclosed space^[4] with a human case (confirmed or probable) during their infectious period	only provided short durations of care, to a human case (confirmed or probable), when an aerosol-generating procedure was not undertaken People who have had face to face social interactions of short^[3] duration only in a non-healthcare setting (e.g. workplace environment or community setting)

[1] Close is defined as within 1 metre, or within an enclosed space^[4].

[2] Prolonged is defined as more or equal to 15 minutes. The time period refers to cumulative exposure.

[3] Short is defined as less than 15 minutes.

[4] Exposure in an enclosed space should be risk assessed based on ventilation in the space, size of the space and proximity of exposure to the human case (confirmed or probable).

[5] Appropriate PPE includes standard and transmission-based precautions (contact and airborne), in line with the [Australian Guidelines for the Prevention and Control of Infection in Healthcare | Australian Commission on Safety and Quality in Health Care](#). This includes gloves, impervious gown, eye protection and N95 / P2 respirator.

Healthcare workers who used appropriate PPE during any contact with a human case (confirmed or probable), or laboratory workers who used appropriate PPE while handling a pathology specimen from a human case (confirmed or probable), are considered to be at negligible exposure risk.

13. Contact management

Sections 12 and 13 relate to advice for management of human contacts of a human case of avian influenza. See [section 14](#) for advice relating to human exposure events to infected animals and contaminated environments.

Education

Contacts of a human case should be counselled about their risk, provided information about the symptoms of AIH ([Appendix A](#)) and monitoring for symptoms (see [Appendix B - Information for people who have been exposed to avian influenza fact sheet](#)). In addition to verbal information, written information and fact sheets should be provided, where possible.

Vaccination

All people in Australia aged ≥ 6 months should be recommended to receive the annual seasonal human influenza vaccination.

The Australian Immunisation Handbook provides additional recommendations for occupational groups to receive the current seasonal human influenza vaccine, including healthcare workers and carers. Additionally, there are recommendations to receive the vaccine during an outbreak of avian influenza for commercial poultry industry workers. See [Influenza \(flu\) | The Australian Immunisation Handbook \(health.gov.au\)](#).

Seasonal influenza vaccine does not protect against avian influenza, and provision of the seasonal influenza vaccine following exposure to avian influenza is not likely to protect against concurrent infection with seasonal influenza for that exposure event (given the shorter incubation period of seasonal influenza virus compared to time taken for effective immunisation). However, seasonal influenza vaccine is routinely recommended to those at risk of avian influenza to prevent future concurrent infection with avian influenza and seasonal influenza, and to prevent the potential risk of the viruses sharing genetic material (reassortment) to produce a new and highly infectious virus that may pose a threat to the wider community (56).

Monitoring

Contacts of a AIH case should undergo health monitoring for 10 days after last exposure. If exposure re-occurs, the 10 days of monitoring should recommence.

Monitoring may be from public health officials (e.g. by phone, email or text) to check the emergence of any signs or symptoms (i.e. active monitoring), or by self-monitoring (i.e. passive monitoring), depending on contact classification.

Although Table 2 includes recommended monitoring frequency, the frequency (e.g. daily) and method (e.g. in person, by phone, email, or text) of active monitoring should be determined by the local PHU with consideration given to reasonable resource allocation

and be proportionate to the level of risk. Other factors that may influence the approach to monitoring contacts include the magnitude of number of contacts, the contact surveillance systems in place, the stage or phase of an outbreak and the supports that a person has or their ability to self-monitor.

Post-exposure prophylaxis

Influenza antivirals (e.g. neuraminidase inhibitors) as post-exposure prophylaxis (PEP) may be effective in preventing disease in contacts. There is limited evidence for human-to-human transmission of avian influenza, so the decision to offer PEP for contacts of AIH cases should use a risk-based approach, taking into consideration the avian influenza subtype and evidence of it causing severe human illness, evidence of human-to-human transmission, exposure risk and individual risk factors for severe disease.

Antiviral PEP is recommended for high risk contacts. This recommendation may be downgraded if the subtype is not associated with severe human illness. Antiviral PEP should be considered for low risk contacts, taking into consideration evidence of the avian influenza subtype to cause severe human illness and the contact's risk for developing severe disease (see [Section 2. Persons at increased risk of severe disease](#)). The expert panel should be consulted for specific advice as needed.

In people recommended for antiviral PEP, it should be commenced as soon as possible (ideally within 48 hours) following exposure and up to 7 days following last exposure. Treating clinicians should assess any contraindications to antiviral medications or required dose adjustments for people with co-morbidities such as renal impairment.

Generally, antivirals should be commenced at the prophylactic dose, and later increased to the treatment dose if a contact later becomes symptomatic. See [Therapeutic Guidelines](#) and [Therapeutic Goods Administration \(TGA\) for Oseltamivir](#).

Asymptomatic contacts

Asymptomatic contacts are not required to quarantine but should be advised to adhere to any public health advice until 10 days following last exposure, with urgent testing and isolation occurring if symptoms commence within the 10 day period.

Testing of asymptomatic contacts in relation to one human case is generally not recommended.

If there is evidence of human-to-human transmission associated with the avian influenza subtype, then the expert panel should undertake a risk assessment to evaluate the level of risk of human-to-human transmission and severe AIH illness, testing of asymptomatic contacts, groups to be tested, time points for testing, and whether the risk level justifies quarantine of contacts.

Symptomatic contacts

All contacts should be provided with a PHU contact number (including after hours), be made aware to contact the PHU urgently if symptoms develop and immediately self-isolate until AIH has been excluded.

Symptomatic contacts should be advised to seek immediate emergency healthcare if required (e.g. call Triple Zero or attend an Emergency Department). They should advise Triple Zero or the Emergency Department that they have been exposed to avian influenza.

If a contact reports symptoms compatible with AIH, the PHU should arrange urgent testing by an appropriately skilled person (e.g. pathology collection staff, nurses or medical practitioner) who is adequately trained in the use of appropriate PPE and consider the need for clinical assessment. Arrangements should be made to ensure transmission-based precautions (contact and airborne) are implemented in the healthcare setting including that the patient will be placed immediately in a single room for assessment, ideally with negative pressure, and does not wait in any common areas. Alternatively, if appropriate, PHUs should consider domiciliary testing to reduce exposure risk to staff and other patients.

A risk-based approach may be taken for testing suspected cases in healthcare settings to balance the risk of accessing a negative pressure room with reducing exposure to staff and patients. [See Section 9. Specimens used for testing](#) for more information. Where testing is required, PHUs should communicate with the public health reference laboratory to ensure laboratory staff are prepared to manage suspected avian influenza samples in the laboratory.

PHUs should consider the epidemiology of other respiratory infections when managing a symptomatic contact. Where there is high suspicion that symptomatic contacts have AIH, they should be recommended for oseltamivir or zanamavir as soon as possible (see [Section 10. Case Management](#)). Treatment remains the responsibility of the treating clinician. Specialist infectious diseases input should be sought, as required.

Table 2: Management of contacts of a human case

Contact type	Management
High risk contacts	Education Provide education, counsel on risk and provide AIH fact sheet. Monitoring Undertake active daily monitoring of symptoms for 10 days following last exposure. Recommence monitoring duration if re-exposed. Isolate if symptoms develop. PEP Antiviral PEP is generally recommended and should be offered, but policies regarding its use should be evaluated by an expert panel based on subtype and ability to cause human illness. Vaccination Recommend seasonal human influenza vaccine. Testing priority Urgent if compatible symptoms develop. Testing of asymptomatic contacts is generally not recommended. Expert panel to evaluate asymptomatic testing of contacts where there is evidence of human-to-human transmission associated with avian influenza subtype. Other Quarantine of asymptomatic contacts is not usually required. High risk contacts should avoid unnecessary visits to high risk settings such as childcare, aged care facilities and health care facilities, unless seeking medical attention. If avian influenza subtype is associated with human-to-human transmission risk, expert panel to evaluate exclusion advice.
Low risk contacts	Education Provide education, counsel on risk and provide AIH fact sheet. Monitoring Undertake active monitoring^[1] of symptoms for 10 days following last exposure. Recommence monitoring duration if re-exposed. Isolate if symptoms develop. PEP Antiviral PEP should be considered in low risk contacts, taking into consideration evidence of the avian influenza subtype to cause severe human illness. Vaccination Recommend seasonal human influenza vaccine. Testing priority High if compatible symptoms develop. Other Quarantine or exclusion of asymptomatic contacts from high-risk settings (such as childcare, aged care facilities, healthcare facilities) is not usually required. If avian influenza

Contact type	Management
	subtype is associated with human-to-human transmission risk, expert panel to evaluate exclusion advice.
Contacts at higher risk of severe AIH	In addition to recommendations for their exposure level, antiviral PEP should be considered for all contacts who are at higher risk of severe AIH (e.g. people with immunocompromising conditions), in consultation with treating clinicians.

[1] The frequency of active monitoring of low risk contacts should be determined by the local PHU with consideration given to reasonable resource allocation and be proportionate to the level of risk.

14. Special situations

Outbreak of avian influenza in animals in Australia

Whilst this scenario falls under Section 14. Special situations, outbreaks of avian influenza in animals reflect the most likely scenario of avian influenza exposure to humans. A One Health approach is key to responding to avian influenza detections in birds or animals, and the response unifies and integrates animal, environmental and human health considerations (see [section 3](#)).

Where a jurisdictional animal health agency reports any outbreak of avian influenza in birds or animals in Australia, a One Health response group should be convened with relevant representatives from jurisdictional human health, environmental and animal health agencies. Animal health agencies may have limited capacity to support a human-health specific response group, and a collaborative approach with a single response group with multiple agencies represented should be considered.

Jurisdictional human health agencies have a responsibility to:

- work collaboratively with animal health and environmental agencies in a One Health framework
- provide public health advice
- assist with risk and exposure assessments
- provide public health management of exposed persons
- actively monitoring high-risk exposed persons
- identify and manage human cases
- facilitate clinically appropriate care, i.e. alerting clinicians, providing advice to clinicians regarding clinical assessment, testing and antiviral PEP recommendations. Antiviral treatment of AIH cases is recommended but remains the responsibility of the treating clinician in consultation with specialist input such as infectious diseases, virology, or microbiology.

Biosecurity measures

Where avian influenza has been detected in animals, the jurisdictional animal health agency should advise on any recommended biosecurity measures during transport of affected animals, the restrictions on the use of feathers, animal products and waste from processing plants, any movement control notices or pest control notices placed on animals or their products and any measures to be implemented to reduce further risks (e.g. culling of affected flocks). Additionally, animal health response measures differ for LPAI and HPAI. HPAI response measures are covered under the [AUSVETPLAN](#).

Infection prevention and control (IPC)

[Appendix E](#) provides PPE recommendations for exposure to avian influenza in animals. Minimum PPE recommendations include: gloves, appropriate footwear, head or hair cover, fluid resistant coveralls, eye protection and N95 / P2 respirator.

Additionally, employers or contracting organisations have a responsibility to ensure staff have appropriate education in IPC and access to PPE, are trained adequately in donning, doffing and disposal of PPE (including fit checking of respirators) and appropriate hygiene or biosecurity measures. Other measures include avoidance of aerosol and dust, adequate ventilation, separation of work and personal clothing and measures to prevent contamination off-site (e.g. contamination of worker accommodation).

Measures should be put in place for reporting breaches in PPE to the PHU to enable risk assessment and follow-up as a contact if needed.

Risk assessment

Upon a notification of an outbreak of avian influenza in birds or animals, a collaborative risk assessment should be undertaken by the One Health response group. Factors informing the risk assessment and risk management approach include:

- avian influenza subtype (evidence of transmissibility to humans and pathogenicity in humans)
- pathogenicity in birds (HPAI vs LPAI) and expected viral shedding amongst infected animals
- affected animal type (e.g. mammal vs poultry)
- date of first symptom onset in affected animals and/or dates and results of recent tests in animals leading up to the positive detection
- epidemiology in wild birds (e.g. previous detections in Australia, likely prevalence in wild bird populations and frequency of spillover to domestic flocks) and details of routine surveillance that is undertaken in wild birds in the vicinity of the affected area
- if detected on a commercial property, the size of the farm or property and any features (e.g. high density), the animal species affected, the activities undertaken and the number of personnel potentially exposed should be considered
- information about the property infrastructure (i.e. buildings, processing areas, dams) and layout, worker roles and duties performed, number of workers and pre-existing biosecurity processes may also be required
- if detected at a private property, details about the number of animals kept on the property, how the animals are housed, whether the animals have come inside residential buildings, and contact that residents, visitors or other people (e.g. vets) may have had with the animals, their environments and any potentially contaminated items and materials.

The exposure categories and management of exposed persons may need to be adapted by jurisdictions depending on the risk assessment, advice from the One Health response

group, expert panel or any additional information that may become available on specific avian influenza strains (e.g. evidence to suggest that some avian influenza strains are associated with longer incubation periods).

Exposure categories – infected animal exposure

All exposed workers, volunteers or people considered potentially exposed to avian influenza infected animals should be assessed by the PHU to determine their use of each recommended PPE item (see [Appendix E](#)). Minimum PPE recommendations include: gloves, appropriate footwear, head or hair cover, fluid resistant coveralls, eye protection and N95 / P2 respirator. Additionally, evidence of PPE training including training in donning and doffing should be assessed.

Table 3: Individuals exposed to infected animals and contaminated objects or environments - definitions and examples

Exposure category	Definition	Examples
High level of exposure	Unprotected direct^[1] contact with: - live or deceased infected animals^[2] and their faeces, litter or products (including eggs prior to commercial cleaning) OR - any contaminated objects, including contaminated clothing, PPE, equipment or surfaces/buildings OR - the contaminated environment, as determined by a risk assessment. This includes staff or visitors to a contaminated location in the 7 days^[3] prior to clinical avian influenza detection (positive test result or first symptom onset) amongst affected poultry – where workers may not have worn adequate PPE^[5] (including	Anyone who was in the same location (e.g. pasture or aquatic waterways) and had direct contact with infected animals or their products, including people collecting or inspecting eggs that have not been commercially cleaned. Contractors clearing waste, without appropriate PPE^[5] Abattoir workers and landfill workers handling infected animals or contaminated products without appropriate PPE^[5] People exposed to backyard pet birds that are infected with avian influenza. If the pet birds entered a home during its infectious period, then the home would be considered a contaminated environment Workers who returned to a contaminated environment without appropriate PPE^[5]

Exposure category	Definition	Examples
	improper removal of PPE), whilst handling animals or their products in that period. OR Unprotected exposure during high risk activities^[4]	Wildlife workers or members of the public who handled or came into direct^[1] contact with an infected live or dead bird or animal without appropriate PPE^[5] Veterinarians who provided care to an infected animal without appropriate PPE^[5] Doffing and handling contaminated PPE or clothes without adequate hand hygiene/infection control measures Workers not effectively complying with use requirements of PPE provided due to inadequate training or discomfort associated with environmental conditions People who hunted, plucked and subsequently handled or butchered infected birds
Low level of exposure	Unprotected exposure in the vicinity of: - live or deceased infected animals^[2] and their faeces, litter or products (including eggs prior to commercial cleaning) OR - the contaminated environment OR Direct^[1] protected contact^[5] with infected animals^[2] or contaminated objects or environments during high risk activities^[4]	Visitors to an infected property who did not wear appropriate PPE^[4] and who were present in the vicinity of infected animals or affected environment only and did not come into direct^[1] contact with any animals or their products, contaminated items or the affected environment Wildlife workers or volunteers who did not come into direct contact with a dead or sick animal that was later confirmed to be infected, but worked in the vicinity of the environment as the

Exposure category	Definition	Examples
	OR Direct, prolonged^[6] and protected contact^[5] with infected animals^[2], contaminated objects or environments	infected animal, without appropriate PPE^[4] People who received eggs from domestic chickens infected by avian influenza (eggs from domestic birds may have surface contamination as they may not be cleaned as thoroughly as commercially farmed eggs) Workers on the property who wore appropriate PPE^[5] at all times, but undertook high risk activities (e.g. culling infected birds, defeathering) Workers or visitors to a property who transit through a contaminated environment without appropriate PPE^[5] Workers on the property who wore appropriate PPE^[5] at all times, but undertook work with infected animals, contaminated objects or environments for prolonged^[6] periods of time
Negligible level of exposure	Protected contact^[5], that was not prolonged^[6], in the vicinity of: - live or deceased infected animals including wild birds and their faeces, litter, products or eggs OR - the contaminated environment OR Workers or visitors to a contaminated property with no contact with:	Workers or visitors on a property undertaking activities for a short period of time and wearing appropriate PPE^[5] throughout Workers or visitors to a property who do not enter contaminated environments and do not perform high risk activities^[4] (e.g. office workers transiting to work through areas deemed not contaminated)

Exposure category	Definition	Examples
	- live or deceased infected animals including wild birds and their faeces, litter, products or eggs AND - the contaminated environment	

[1] Direct contact includes handling, hand-feeding, collecting eggs or other animal products, cleaning out enclosures of animals, or other contact with animal faeces or waste, as well as veterinary attendances.

[2] Animals include wild birds, domestic birds (such as pet birds or small-scale production birds not classified as commercial) and commercial birds, as well as animals where there has been evidence of spillover from birds to other animals (e.g. dairy cows with HPAI A(H5N1) clade 2.3.4.4b).

[3] Inclusion of 7 days of exposure pre-confirmation of clinical cases in birds reflects the incubation period of HPAI being from several hours to up to 10 days in birds. In practice, exposed persons have been identified and managed as exposed between 4 to 10 days prior to onset of clinical cases in birds. Duration may be informed by aspects such as the avian influenza subtype, frequency of testing birds on the property, and period of illness in the birds and likely onset of outbreak.

[4] High risk activities includes activities such as slaughtering, defeathering, butchering or performing antemortem or post-mortem inspections of infected live or deceased birds. The One Health response group may determine additional activities that are considered to be high risk.

[5] Appropriate PPE for protection includes all recommended PPE equipment as outlined in [Appendix E](#). Minimum PPE recommendations include: gloves, appropriate footwear, head or hair cover, fluid resistant coveralls, eye protection and N95 / P2 respirator.

[6] Prolonged is defined as more or equal to 15 minutes. The time period refers to cumulative exposure.

Exposed persons - management

See [Section 13 - Contact management](#) for general principles in managing people at risk of avian influenza, which apply to people exposed to avian influenza from animal sources. The management of individuals exposed to avian influenza from infected animals, based off their exposure level, are presented in the table below.

Table 4: Exposed individuals to avian influenza infected animals - management

Exposure category	Management
High level of exposure	Education Provide education, counsel on risk and provide AIH fact sheet. Vaccination Recommend the seasonal human influenza vaccine. Monitoring Undertake active^[1] daily monitoring of symptoms for 10 days following last exposure. Recommence monitoring duration if re-exposed (including if there are breaches in PPE).

Exposure category	Management
	Advise contact to isolate if symptoms develop, promptly contact PHU in non-emergency situations and to seek medical attention if needed (wearing a mask if possible and notifying health personnel of contact with avian influenza). Testing priority Urgent if compatible symptoms develop. Domiciliary testing should be facilitated where possible. PEP Recommend antiviral PEP, in consultation with treating clinician. Other Exposed individuals are not required to be quarantined. Exclusion of asymptomatic contacts from high risk settings (such as childcare, aged care facilities, healthcare facilities) is not usually required. If avian influenza subtype is associated with human-to-human transmission risk, expert panel to evaluate exclusion advice. Avoid contact with other birds outside any biosecurity zones, as per AUSVETPLAN recommendations. Isolate and exclude from workplace if symptoms develop. These recommendations should be for 10 days following last exposure.
Low level of exposure	Education Provide education, counsel on risk and provide AIH fact sheet. Vaccination Recommend the seasonal human influenza vaccine. Monitoring Advise contact to self-monitor symptoms for 10 days following last exposure. Advise contact to isolate if symptoms develop, promptly contact PHU in non-emergency situations and to seek medical attention if needed (wearing a mask if possible and notifying health personnel of contact with avian influenza). Testing priority High if compatible symptoms develop. Domiciliary testing should be facilitated where possible. PEP Antiviral PEP should be considered for people with a low level of exposure, taking into consideration evidence of the avian influenza subtype to cause severe human illness. Other Exposed individuals are not required to be quarantined. No active follow up required unless symptoms develop or the situation changes, for example a human case is identified.

Exposure category	Management
Negligible level of exposure risk (baseline risk)	No active follow up required. PHUs may choose to provide advice for self-monitoring and to contact PHU if symptoms develop so testing can be arranged. This exposure category is not recommended to receive antiviral PEP.
Exposed persons at higher risk of severe AIH	Where a risk assessment suggests the outbreak avian influenza subtype is associated with severe disease, antiviral PEP may be considered for selected high risk individuals regardless of their level of exposure risk (e.g. people at increased risk of severe disease).

[1] The method and frequency of monitoring should be determined by the local PHU with consideration given to reasonable resource allocation and be proportionate to the level of risk. Frequent daily contact may result in disengagement in exposed contacts or broader hesitancy to engage with public health amongst at risk workers.

Additionally,

- Consider targeted seasonal human influenza vaccination promotion to at-risk occupational groups to increase uptake in this cohort as part of the outbreak response (e.g. through pop-up/outreach vaccination clinics and/or targeted communications). Vaccination promotion should be targeted at poultry or animal workers directly involved in the animal health response, but also those in surrounding quarantine/control restricted areas as determined by animal health authorities as being at increased risk of avian influenza. Partnership with ACCHS should be undertaken, where indicated.
- Consider the need to establish seasonal human influenza vaccination clinics for occupational workers who may be at risk of exposure. For biosecurity reasons, clinics should not be established at infected premises, but nearby, to enhance accessibility and uptake. The decision to establish a vaccination clinic should consider the potential risk to vaccinators and the ongoing risk of avian influenza exposure in infected animals or the environment. The establishment of vaccine clinics post-outbreak may be appropriate to improve coverage amongst at-risk occupational groups.
- The impact on a poultry farm in respect to culling of their flocks and restriction of movement can be extremely traumatic and result in significant mental distress. The health response should consider facilitating connection of those involved in the response to a suitable mental health service or providing a list of mental health resources available in the local area or mental health resources targeting impacted occupational groups (e.g. FarmSafe). Additionally, where there is concern for avian

influenza in Aboriginal and Torres Strait Islander communities, consider recommending services such as 13 YARN and the use of interpreter services.

Laboratory testing

In the event of an outbreak of avian influenza in animals, the testing pathways should be identified for exposed persons, in the event they may become symptomatic. This is particularly important in the context of avian influenza detections in regional areas and the need processes to be established to refer pathology samples to a reference laboratory in a timely manner. See [Section 9 - Laboratory testing](#).

Detection of a human case(s) following outbreak of avian influenza in animals

Where a case is detected, the PHU should manage the case and any identified contacts according to the [Section 10 – Case management](#) and [Section 13 – Contact management](#). Where an individual has been exposed to avian influenza infected animals and has been identified as a contact of a case, they should be managed accordingly with the greater exposure risk.

Where a human case is detected, the expert panel should consider:

- management of individuals exposed to avian influenza infected animal/s who are not otherwise classified as a contact of a human case. This should be considered in conjunction with the One Health response group, to ensure impacts on biosecurity controls are minimised.

Where a cluster of human cases is detected, consideration should be given to:

- evaluate the likelihood of human-to-human transmission versus co-exposure to infected animals/birds
- the ability to accurately identify contacts and the role of re-classification of contacts or exposed persons and the resulting public health management including quarantine, testing (including asymptomatic testing and time points for testing), antiviral PEP recommendations, and any resulting biosecurity implications.

Environmental evaluation and management

Where avian influenza has been detected in animals, the One Health response group should undertake a risk assessment, ecological assessment and determine areas that may be contaminated with avian influenza virus.

Additionally, avian influenza viruses can persist for extended periods in water, faeces and the environment. The One Health response group should evaluate the likely survivability of avian influenza viruses to identify any contaminated environmental areas, with considerations for:

- likely level of contamination

- evidence of transmissibility or severity of human infections for avian influenza subtype involved
- environmental conditions including factors such as relative humidity, moisture or temperature, UV exposure (poorer UV exposure can facilitate avian influenza survivability in environment), wind and ventilation, particularly in enclosed spaces
- any available evidence in literature on environmental survivability for that specific avian influenza strain.

Depending on virus survivability in environmental conditions, as informed by the risk assessment, the contaminated areas should be isolated and avoided for the duration as recommended by the One Health response group, or until decontamination has occurred. If workers require access to these areas, they should be wearing the appropriate PPE as recommended in [Appendix E](#), and their exposure level re-classified depending on their exposure risk. Minimum PPE recommendations include: gloves, appropriate footwear, head or hair cover, fluid resistant coveralls, eye protection and N95 / P2 respirator.

Communications

If avian influenza has been detected in animals, the relevant jurisdictional animal health agencies, public health officials and/or employer may consider communications to raise public awareness, communicate risk and engage industry and workers. Jurisdictional public health and animal health agencies should agree on which agency leads any public communications. Typically, where there have been detections of avian influenza in animals only, communications should be led by animal health agencies. Communications may include referencing resources such as those produced by Wildlife Health Australia, or communications via the National Biosecurity Communication and Engagement Network.

Exposed workers

- providing verbal and written information to people who were exposed to the infectious animals about the risk of infection, the methods of minimising the risk, symptoms to be alert for, and to report to the PHU promptly, should symptoms occur or a breach in PPE occurs. Information to exposed workers may be ideally provided via the employer on site
- identifying at-risk occupations and providing communications to those workers to ensure they are aware of recommendations to protect themselves against exposure to avian influenza, including the recommendation to receive the seasonal human influenza vaccine.

Industry

- identifying at-risk occupations and providing communications to those workers to ensure they are aware of recommendations to protect themselves against exposure to avian influenza, including the recommendation to receive the seasonal human influenza vaccine

- the need for vigilance about unusual illness in poultry, other birds and animals, and the requirement for reporting to animal health authorities
- advice on the importance of biosecurity, particularly in regions with detection of avian influenza in animals.

Peripheral animal-related industries (e.g. veterinarians, animal transport companies)

- information about the general location of concern (e.g. control zones) and advice about what to do if they receive or come in contact with animals from the control zones
- the recommendation to receive the seasonal human influenza vaccine to relevant employees
- the need for vigilance about unusual illness in poultry, other birds and animals, and the requirement for reporting to animal health authorities.

Public

- provide advice to domestic bird owners (including pet bird owners) on preventing contact with wild life and other biosecurity measures
- advise the general public to avoid approaching or touching sick or dead animals, including recommendations to prevent domestic animals from coming in contact with wild animals, with reference to public fact sheets produced by Wildlife Health Australia (see [High pathogenicity avian influenza information - H5N1 global outbreak \(wildlifehealthaustralia.com.au\)](http://wildlifehealthaustralia.com.au))
- the recommendation to receive the seasonal human influenza vaccine
- assurances concerning public health risks and safety of poultry and other animal products.

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16. Appendices

The following documents are included in the appendices:

- [Appendix A: Avian Influenza in Humans – Fact sheet](#)
- [Appendix B: Avian Influenza in Humans – Information on health monitoring for people who have been exposed to avian influenza](#)
- [Appendix C: Avian Influenza in Humans – Public Health Unit checklist](#)
- [Appendix D: Avian Influenza in Humans – Investigation Form](#)
- [Appendix E: Avian Influenza – Checklist for Public Health Units for assessing appropriate PPE](#)

Appendix A: Avian Influenza in Humans – Fact sheet

Avian influenza in humans

What is avian influenza (also known as ‘bird flu’)?

Avian influenza is caused by a number of different strains of influenza A viruses. Avian influenza viruses mainly spreads among wild birds and usually cause no or mild disease. They can also infect poultry. Avian influenza viruses are classified into high pathogenicity avian influenza (HPAI) and low pathogenicity avian influenza (LPAI) depending on the severity of disease in poultry.

Certain strains of avian influenza can infect some mammals, including seals, foxes and cattle. Rarely, humans can be infected. This has usually been after close contact with infected animals or contaminated environments.

What are the symptoms in humans?

As with seasonal human influenza, a person infected with avian influenza may have no symptoms, mild respiratory symptoms, or symptoms typical of the seasonal influenza (fever, cough, tiredness, muscle aches, sore throat, shortness of breath, runny nose, headache). Diarrhoea, nausea and vomiting may also occur. Red and sore eyes (conjunctivitis) can also occur.

Some people may experience more severe illness, such as infection of the lungs and inflammation of the brain. Infections by avian influenza have led to death.

Symptoms usually appear between 2 and 10 days following exposure.

How does avian influenza spread to humans?

From infected animals and their environments

- Infected animals can shed large amounts of virus in their faeces or secretions which can contaminate their surrounding environment.
- Direct contact with infected animals, or contaminated surfaces and objects, is the main way that humans might become infected. Contaminated dust may also be breathed in or rubbed into the eyes.
- Certain activities also increase the risk of exposure such as slaughtering, butchering, and preparation of animals for cooking.

Avian influenza cannot be transmitted to humans through the consumption of properly cooked meat or products (including eggs).

From a person infected with avian influenza

Humans with avian influenza do not easily transmit the virus to other humans. When this has occurred, it has been due to close contact with a sick person over several days.

Who is at risk of infection?

Most people are not at risk of infection. People with higher risk include those who have contact with infected animals or their secretions (including at work), or possibly if caring for a person infected with avian influenza.

You may also be at higher risk if you travel to a country that has avian influenza and have contact with animals infected with avian influenza.

How is it prevented?

People who are in contact with patients with avian influenza or who are working with infected animals must follow workplace health and safety practices. This includes isolation of the symptomatic patient, the use of personal protective equipment (e.g. gloves, appropriate footwear, head or hair cover, fluid resistant coveralls, eye protection and N95 / P2 respirator), complying with infection prevention and control practices and procedures. This may include recommendations for influenza antiviral medication. People should stay away from work if they have respiratory symptoms.

Laboratory workers handling specimens must follow special safety requirements.

People travelling to areas affected by avian influenza should avoid contact with unwell and deceased animals, poultry farms and live bird “wet” markets; wash their hands thoroughly after handling uncooked meat or animal products (including eggs); and ensure proper handling and cooking of meat and animal products. Refer to the Smart Traveller (<https://www.smartraveller.gov.au/>) website for additional country-specific advice.

Vaccination

Vaccination with the current seasonal human influenza vaccine each year is strongly recommended for anyone who has been directly exposed to animals infected with avian influenza or may be exposed to avian influenza during their work. Ideally, influenza vaccination should occur at least 14 days prior to a potential exposure.

While the human seasonal influenza vaccine does not protect against avian influenza, it reduces the risk of infection with human and avian influenza at the same time. There is a possibility that if a person is infected with both viruses, the viruses could share genetic material (reassortment) to produce a new virus that may spread between people more easily.

How is it diagnosed?

The specimens collected for human avian influenza testing are similar to those used for seasonal influenza. Usually swabs are taken from the nose and throat. If there are eye symptoms (e.g. red and sore eyes), a swab may be taken from the eye as well. The specimens collected are then tested at specialised laboratories to confirm or exclude avian influenza.

How is it treated?

Specific influenza antivirals are likely to be effective against avian influenza in humans and are used to treat people with avian influenza virus infections. Isolation of the case and supportive medical care may be necessary.

What is the public health response?

Doctors and laboratories must notify people diagnosed with avian influenza to their local public health unit. Public health unit staff will work with the case, the treating doctors, and the laboratory to confirm the diagnosis, find out how the infection may have occurred and identify others who may be at risk of infection. Cases should isolate until they are no longer infectious.

Contacts will be counselled about the risk of infection. Contacts without symptoms do not usually need to stay at home. Additionally, public health unit staff will advise the contact if they should avoid any people who may be at risk of severe illness, as a precaution. If the contact develops symptoms, they will be asked to isolate and be tested for avian influenza. Contacts should also avoid contact with birds outside of any quarantine zones (as defined by local animal health agencies). These recommendations should be followed for 10 days after the person was last exposed. They may also be recommended for other therapies depending on what the risk is.

For more information

Contact your health practitioner or local public health unit.

Public Health Unit Contact Details

For further health information, phone your local public health unit.

Public health unit

Phone number:

Related links

- [Bird flu | Australian Centre for Disease Control \(cdc.gov.au\)](https://www.cdc.gov.au/australian-centre-for-disease-control)
- [Australian Government Department of Health and Aged Care - Avian influenza](https://www.health.gov.au/australian-government-department-of-health-and-aged-care-avian-influenza)
- [Avian influenza \(bird flu\) - DAFF \(agriculture.gov.au\)](https://www.agriculture.gov.au/avian-influenza-bird-flu)
- [Wildlife Health Australia](https://www.wildlifehealthaustralia.gov.au/)
- [Australian Government Smartraveller](https://www.australiangovernment.gov.au/australian-government-smartraveller)
- [World Health Organization \(WHO\) - Influenza \(avian and other zoonotic\)](https://www.who.int/avian-influenza)

Appendix B: Avian Influenza in Humans – Information on health monitoring for people who have been exposed to avian influenza

You have been given this fact sheet because you have been exposed to avian influenza.

What is avian influenza?

Avian influenza is caused by a number of different strains of influenza A viruses. Avian influenza viruses mainly spreads among wild birds and usually cause no or mild disease. They can also infect poultry.

Certain strains of avian influenza, such as H5N1, can infect some mammals, including seals, foxes and cattle. Rarely, humans can be infected. This has usually been after exposure to infected animals or contaminated environments.

Why do I need to self-monitor for symptoms?

There is a small risk of people getting infected with avian influenza after being exposed.

You should monitor your health for any symptoms of avian influenza. If you develop any symptoms, you should contact your local public health unit.

Staff from your local public health unit may also actively monitor your health by contacting you regularly to check if you have any symptoms or not. Your local public health unit will let you know if they plan to do this.

As long as you remain free of symptoms, you do not need to quarantine and may continue your normal daily activities, unless otherwise advised by your local public health unit.

How long do I need to monitor for symptoms?

You need to monitor for symptoms for 10 days after your last day of exposure.

If you continue to be exposed, you will be asked to closely monitor your health until 10 days have passed since your last exposure date.

Self-monitoring for symptoms involves watching out for the below symptoms:

- Fever >38°C, 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 get any symptoms, you must:

- Isolate yourself from other people
- Report the illness to your local public health unit (see contact details below). Your public health unit will coordinate testing to confirm if you have been infected by avian influenza or not. Additionally, they may ask you questions to identify other people who may have been exposed, provide you more information and help answer any questions you may have
- Phone your doctor for an appointment and report that you may have been in contact with the avian influenza virus. Your local public health unit may be able to help arrange a review by a doctor as well.
- Practice good respiratory hygiene by covering your mouth when coughing or sneezing. 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. Dispose of used tissues in a bin
- **In a medical emergency, always seek immediate health care or phone Triple Zero (000). Tell them if you have been exposed to avian influenza.**

Date of last contact with an avian influenza case: _____

Monitor health until: _____

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:

- [Bird flu | Australian Centre for Disease Control \(cdc.gov.au\)](https://www.cdc.gov.au)
- [Australian Government Department of Health and Aged Care - Avian influenza](https://www.health.gov.au)
- [Avian influenza \(bird flu\) - DAFF \(agriculture.gov.au\)](https://www.agriculture.gov.au)
- [Wildlife Health Australia](https://www.wildlifehealthaustralia.org.au)
- [Australian Government Smartraveller](https://www.australiangovernment.gov.au)
- [World Health Organization \(WHO\) - Influenza \(avian and other zoonotic\)](https://www.who.int)

Appendix C: Avian Influenza in Humans – Public Health Unit checklist

Probable or confirmed cases should be immediately notified to the relevant state or territory public health unit (PHU).

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 or hospital area (e.g. emergency department, healthcare staff). May need discussion with infection control teams.
Contact the patient (or caregiver) to:	
	Complete the investigation form
	Check infection control measures are in place
	Identify contacts and obtain their contact details
	Provide with Avian Influenza in Humans – Fact sheet
Contact laboratory to:	
	Check samples received, expediate testing or obtain any outstanding results
Confirm case:	
	Assess information against surveillance case definitions
Contact patient's contacts to:	
	Assess risk of avian influenza (exposure history), determine category for management and counsel contact on their risk
	Determine symptom status
	Explain symptoms of avian influenza and need to isolate and call public health if symptoms develop

Contact the patient's doctor to:	
	Advise the need for monitoring of health (active or passive depending on exposure category), including duration of monitoring
	Recommend therapies, as indicated (e.g. seasonal human influenza vaccine, post-exposure prophylaxis antivirals)
	Assess and arrange best method for delivering intervention to contacts
	Provide with Information for people who may have been exposed to avian influenza fact sheet
	Ensure access to a thermometer and telephone
Other actions:	
	Immediately report details of case and management plan to state/territory communicable disease branch (CDB)
	Enter case data onto notifiable diseases database within 1 working day of notification
	In collaboration with CDB, consider a media release and report human cases to jurisdictional animal health agency for investigation of possible animal sources or risk to poultry and other animals

Appendix D: Avian Influenza in Humans – Investigation Form

AVIAN INFLUENZA IN HUMANS (TO BE COMPLETED FOR PROBABLE AND CONFIRMED CASES)					
PHU:			NND no.		
Interviewer name:			Telephone:		
NOTIFICATION					
Date of notification:	___ / ___ / ___		Date of initial response:	___ / ___ / ___	
First Notifier:		Telephone:		Fax:	
Notifier type No. in order of receipt	___ Lab ___ Doctor ___ Hospital (not lab) ___ Other: _____	Notified date	___ / ___ / ___	Received date	___ / ___ / ___
Treating doctor:	Name:				
	Address:				
	Practice name:				
	Telephone:		Fax:		
CASE DEMOGRAPHICS					
Surname:			Given name:		
Sex:	☐ Male ☐ Female ☐ Other - specify _____	DOB:	___ / ___ / ___	Age:	___ yrs/___ mths
Address:					
Suburb:		State / Territory:		Postcode:	
Telephone:		Mobile:		Email:	

Other contact:				Telephone:	
Indigenous status:	☐ Aboriginal ☐ Torres Strait Islander ☐ Both Aboriginal and Torres Strait Islander ☐ Not Indigenous ☐ Not stated	Country of Birth:	☐ Australia ☐ Other: specify _____	Primary Language:	☐ English ☐ Other: specify _____
Occupation/ school:	Role (of case):				
	Name of workplace / school:				
	Address:				
	Contact person:		Telephone:		
General Practitioner:	Name:				
	Address:				
	Practice name:				
	Telephone:		Fax:		
CLINICAL DETAILS					
Symptoms present?	Yes No Unknown				
Onset of First Symptoms:	Date ____ / ____ / ____		Time: _____ AM / PM		
Fever >38°C, shakes or chills	☐ Yes ☐ No ☐ Unknown If yes, date of fever onset: ____ / ____ / ____ Time: _____ AM / PM				
Cough	☐ Yes ☐ No ☐ Unknown If Yes: ☐ Productive ☐ Non-productive				
Difficulty Breathing/Dyspnoea	☐ Yes ☐ No ☐ Unknown				
Headache	☐ Yes ☐ No ☐ Unknown				
Myalgia	☐ Yes ☐ No ☐ Unknown				
Rhinorrhoea (runny nose)	☐ Yes ☐ No ☐ Unknown				
Sore Throat	☐ Yes ☐ No ☐ Unknown				

Fatigue	☐ Yes ☐ No ☐ Unknown
Rigors	☐ Yes ☐ No ☐ Unknown
Vomiting	☐ Yes ☐ No ☐ Unknown
Diarrhoea	☐ Yes ☐ No ☐ Unknown
Conjunctivitis	☐ Yes ☐ No ☐ Unknown
Confusion	☐ Yes ☐ No ☐ Unknown
Other Symptoms	☐ Yes ☐ No ☐ Unknown If Yes, provide details: _____
Details of other abnormal findings (e.g. haematology, biochemistry, CXR, CT scan)	
Co-morbidities	☐ Yes ☐ No ☐ Unknown If Yes, provide details: _____

LABORATORY

Lab confirmed	☐ Yes ☐ No	Specimen(s)	_____	Specimen date/(s)	___/___/___
		(including type and site of collection)	_____		___/___/___
		Subtype	_____	ID method	_____
			_____		_____

VACCINATION HISTORY

Previous vaccination against seasonal influenza?	☐ Yes ☐ No ☐ Unknown If Yes, most recent year: _____
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HOSPITAL ADMISSION HISTORY (in Australia)

Hospitalised?	☐ Yes ☐ No ☐ Unknown If Yes, hospital name: _____ Date admitted: ___/___/___ Date discharged: ___/___/___
----------------------	---

Treating Doctor	Name: _____ Position: _____ Contact No: _____
Isolation & level of precautions	☐ Yes ☐ No ☐ Unknown If Yes, dates of period of isolation: ____/____/____ to ____/____/____ Airborne precautions for duration of isolation: ☐ Yes ☐ No ☐ Unknown Contact precautions for duration of isolation: ☐ Yes ☐ No ☐ Unknown
ICU Admission	☐ Yes ☐ No ☐ Unknown If Yes, dates of ICU admission: ____/____/____ to ____/____/____
Mechanical Ventilation	☐ Yes ☐ No ☐ Unknown

TREATMENT DETAILS

	Name of treatment, dose, frequency, duration of therapy	Commencement date and completed date
Antivirals. Please list and include dates given.		
Other (e.g. antibiotics). Please list and include dates given.		

EXPOSURE HISTORY

Exposure Period Date: ____/____/____ to ____/____/____ (10 days before onset date) (1 day before onset date)	
Contact with an infectious human case of avian influenza in 10 days before symptom onset? ☐ Yes ☐ No ☐ Unknown If Yes, date of last contact with a case? ____/____/____ Details of exposure: Name: _____ Relationship: _____ Dates of contact: _____ Type of contact: _____	

Location/setting of contact: _____ Duration of contact: _____ Proximity of contact (in metres): _____ Appropriate PPE used? ☐ Yes ☐ No ☐ Unknown • Details of PPE used: _____ • Any PPE breaches? ☐ Yes ☐ No ☐ Unknown Did contact with case occur in: ☐ Australia ☐ Overseas – <i>specify country:</i> _____ If 'Overseas', provide details in 'Travel History'						
Contact with avian influenza laboratory samples in 10 days before symptom onset? ☐ Yes ☐ No ☐ Unknown If Yes, date of last contact with such samples? ____/____/____ Appropriate PPE used? ☐ Yes ☐ No ☐ Unknown • Details of PPE used: _____ • Any PPE breaches? ☐ Yes ☐ No ☐ Unknown						
In the 10 days before symptom onset, contact with: • Any unwell or dead animals, their faeces, litter or products? ☐ Yes ☐ No ☐ Unknown • Any objects or environments contaminated with AI? ☐ Yes ☐ No ☐ Unknown • Any animals? ☐ Yes ☐ No ☐ Unknown If Yes to any of the above, provide details in 'Exposure within Australia' or 'Travel History'						
Consumed raw / undercooked animal products in 10 days before symptom onset? ☐ Yes ☐ No ☐ Unknown If Yes: Dates of consumption: _____ Type of meat or animal product: _____ Location(s): _____						
Exposure to infected animals or birds within Australia						
Please supply locations of interactions with unwell or dead animals, their products or contaminated environments from 10 days before symptom onset to the present.						
Location	Date(s) of exposure	Type of animal(s) and/or product and / or environment(s) involved in exposure	Details of contact / activities undertaken*	Duration of activities	Details of any PPE worn (state if no PPE was worn or unknown) (Refer Appendix E)	Any PPE breaches?

*Examples include: direct contact (handling, hand-feeding, collecting eggs or other animal products, cleaning out enclosures of animals, or other contact with animal faeces or waste); high-risk activities (slaughtering, de-feathering, butchering, performing ante- or post-mortem inspections of infected live or deceased animals infected with AI); environmental (such as live animal markets, swimming or bathing in contaminated water, residing in an area with large numbers of sick animals).

Travel History

1. ITINERARY

Please supply an itinerary of travel from 10 days before symptom onset to the present. Include visits to all 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 COUNTRIES

Attach a separate page for each country visited.

Name of Country: _____		Was it in transit? ☐ Yes ☐ No
If in transit, please specify details below:		
Airport	Transit Date/s	Transit Time (hrs)

Did the case leave the airport during transit? ☐ Yes ☐ No

Did the case travel within the country? ☐ Yes ☐ No

If Yes, detail all places visited below:

Name of Place Visited	Contact with unwell or dead animal?*	Type of animal	Type of contact**	Date(s) of contact
	☐ Yes ☐ No ☐ Unknown			
	☐ Yes ☐ No ☐ Unknown			
	☐ Yes ☐ No ☐ Unknown			
	☐ Yes ☐ No ☐ Unknown			
	☐ Yes ☐ No ☐ Unknown			

*currently known to have been infected with AI (including for specific AI subtype, if known at time of interview)

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

Reason for visit:

- Business: ☐ Yes ☐ No
- Holiday: ☐ Yes ☐ No (If Yes, complete details below)
- Visit family/friends: ☐ Yes ☐ No

Other – *specify*: _____

If holiday:

Was the case on a tour? ☐ Yes ☐ No

If Yes, provide the following details:

- Name of tour and tour company: _____
- Dates travelled on tour: ____/____/____ to ____/____/____
- Other countries visited on tour: _____

INFECTIOUS PERIOD

Did the case visit any high-risk settings (e.g. childcare, aged care and healthcare facilities) during their infectious period?

☐ Yes ☐ No ☐ Unknown

If Yes, detail all places visited below:

Name of place visited	Type of setting	Date of attendance

Contacts					
Name	Type of contact [#]	High or low risk?	Telephone	Seasonal human influenza vaccine	Interventions (including health monitoring type and dates)
		☐ High ☐ Low		☐ Already received at time of interview ☐ Recommended <i>If recommended:</i> Date received: ____/____/____ ☐ Recommended but declined ☐ Other: _____	☐ Provided monitoring fact sheet ☐ Recommended for antivirals Health Monitoring: ☐ Active ☐ Passive Monitor until: ____/____/____ <i>If active:</i> Frequency of monitoring (daily, second daily): _____ Method of monitoring (SMS, email, phone call): _____ Other interventions (details): _____
		☐ High ☐ Low		☐ Already received at time of interview ☐ Recommended <i>If recommended:</i> Date received: ____/____/____ ☐ Recommended but declined ☐ Other: _____	☐ Provided monitoring fact sheet ☐ Recommended for antivirals Health Monitoring: ☐ Active ☐ Passive Monitor until: ____/____/____ <i>If active:</i> Frequency of monitoring (daily, second daily): _____ Method of monitoring (SMS, email, phone call): _____ Other interventions (details): _____
		☐ High ☐ Low		☐ Already received at time of interview ☐ Recommended <i>If recommended:</i> Date received: ____/____/____ ☐ Recommended but declined ☐ Other: _____	☐ Provided monitoring fact sheet ☐ Recommended for antivirals Health Monitoring: ☐ Active ☐ Passive Monitor until: ____/____/____ <i>If active:</i> Frequency of monitoring (daily, second daily): _____ Method of monitoring (SMS, email, phone call): _____ Other interventions (details): _____

				☐ Recommended but declined ☐ Other: _____	<i>If active:</i> Frequency of monitoring (daily, second daily): _____ Method of monitoring (SMS, email, phone call): _____ Other interventions (details): _____
		☐ High ☐ Low		☐ Already received at time of interview ☐ Recommended <i>If recommended:</i> Date received: ____ / ____ / ____ ☐ Recommended but declined ☐ Other: _____	☐ Provided monitoring fact sheet ☐ Recommended for antivirals Health Monitoring: ☐ Active ☐ Passive Monitor until: ____ / ____ / ____ <i>If active:</i> Frequency of monitoring (daily, second daily): _____ Method of monitoring (SMS, email, phone call): _____ Other interventions (details): _____
		☐ High ☐ Low		☐ Already received at time of interview ☐ Recommended <i>If recommended:</i> Date received: ____ / ____ / ____ ☐ Recommended but declined ☐ Other: _____	☐ Provided monitoring fact sheet ☐ Recommended for antivirals Health Monitoring: ☐ Active ☐ Passive Monitor until: ____ / ____ / ____ <i>If active:</i> Frequency of monitoring (daily, second daily): _____ Method of monitoring (SMS, email, phone call): _____ Other interventions (details): _____
		☐ High ☐ Low		☐ Already received at time of interview ☐ Recommended <i>If recommended:</i> Date received: ____ / ____ / ____ ☐ Recommended but declined ☐ Other: _____	☐ Provided monitoring fact sheet ☐ Recommended for antivirals Health Monitoring: ☐ Active ☐ Passive Monitor until: ____ / ____ / ____ <i>If active:</i> Frequency of monitoring (daily, second daily): _____ Method of monitoring (SMS, email, phone call): _____ Other interventions (details): _____

				___ / ___ / ___ ☐ Recommended but declined ☐ Other: _____	<i>If active:</i> Frequency of monitoring (daily, second daily): _____ Method of monitoring (SMS, email, phone call): _____ Other interventions (details): _____
		☐ High ☐ Low		☐ Already received at time of interview ☐ Recommended <i>If recommended:</i> Date received: ___ / ___ / ___ ☐ Recommended but declined ☐ Other: _____	☐ Provided monitoring fact sheet ☐ Recommended for antivirals Health Monitoring: ☐ Active ☐ Passive Monitor until: ___ / ___ / ___ <i>If active:</i> Frequency of monitoring (daily, second daily): _____ Method of monitoring (SMS, email, phone call): _____ Other interventions (details): _____

e.g. household, household like, airplane travel, car travel

OUTCOME (circle all that apply)

Notification decision:

- ☐ Confirmed – Avian influenza case
☐ Probable – Avian influenza case
☐ Alternative diagnosis made (fill in details below)

Additional details for alternative diagnosis

- Alternative diagnosis: _____
 - Was there supporting microbiological evidence? ☐ Yes ☐ No ☐ Unknown
- If Yes, specify details: _____

Case Recovered?

☐ Yes ☐ No ☐

Unknown

Case Died?

☐ Yes ☐ No ☐ Unknown

If Yes, was an autopsy conducted? ☐ Yes ☐ No ☐ Unknown

Results of autopsy:

Notes:

ADMINISTRATION

Completed by		Date finalised	__ / __ / __	PHU	
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Appendix E: Avian Influenza in Humans – Public Health Unit checklist for appropriate PPE use during animal exposures

The following personal protective equipment (PPE) recommendations are the minimum level of PPE when in contact with animals infected (or suspected to be infected) with avian influenza, their bodily fluids, carcasses, other bodily materials (e.g. feathers, hides) or contaminated objects and environments where the animals live or are kept.

Minimum PPE recommendations include: gloves, appropriate footwear, head or hair cover, fluid resistant coveralls, eye protection and N95 / P2 respirator.

Disposable items are preferred.

People at risk of exposure to avian influenza should receive PPE training including the ability to fit check. A fit check should be performed each time a respirator is applied or adjusted.

Below is a checklist to assess appropriate PPE use during animal exposures.

Personal protective equipment

P2 or N95 face mask	Yes / No
Powered air purifying respirators (PAPR) (if required)	Yes / No
Fluid resistant coveralls	Yes / No
Gloves (disposable)	Yes / No
Gloves (heavy duty that can withstand disinfection)	Yes / No
Protective eyewear (e.g. goggles and/or face shields)	Yes / No
Waterproof aprons (if required for task e.g. heavy soiling)	Yes / No
Head/hair covers	Yes / No
Disposable boots or shoe covers, or gumboots that can withstand disinfection	Yes / No

PPE procedure

Did the person have a PPE spotter	Yes / No
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Personal protective equipment

Doffing procedure satisfactory	Yes / No
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Facilities and amenities to enable adequate infection prevention and control

Soap available	Yes / No
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Alcohol based hand rub available	Yes / No
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Shower available on site	Yes / No
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Disinfectant wipes available	Yes / No
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Staff records – training

Record of staff PPE trained (donning, use and doffing)	Yes / No
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Record of staff fit checking trained and compliant	Yes / No
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Trained in PAPR use, if used (including correct cleaning and maintenance)	Yes / No
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