

## **Notification Timeline for Potential Exposures to Notifiable Avian Influenza (NAI)<sup>1</sup>:**

*To support timely investigation and response to potential Avian influenza exposures, notification timelines are based on confirmed positive results or a preliminary non-negative. Confirmation can take weeks at a national lab<sup>2</sup>.*

**The Ministry of Agriculture to Ministry of Health<sup>3</sup>:** within 1 business day<sup>4</sup>

**The Canadian Wildlife Health Cooperative to Ministry of Health<sup>3</sup>:** within 1-3 business days of receiving a non-negative<sup>2</sup> sample for individuals who have provided their contact information in the submission forms.

**Ministry of Health to Local Medical Health Officer:** within 1 business day

Public Health may receive notification of potential exposures from members of the public or health care providers.

### **From Public Health to Ministry of Health:**

Public health investigations should be reported as *suspect outbreaks* (See [Attachment – Reporting Investigations of Avian Influenza Exposures](#) and [Guidelines for Submitting Outbreak Notification and Summary Report](#)).

**Reporting symptomatic contacts (i.e., suspect cases, Refer to [Part II](#)**

**Public Health Follow-up Timeline:** initiate within 24-48 hours<sup>5</sup>.

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<sup>1</sup> In Canada, highly pathogenic avian influenza and low pathogenicity H5 and H7 avian influenza viruses are considered to be Notifiable Avian Influenza, which is a [reportable disease](#) under the federal *Health of Animals Act*. Animal owners, veterinarians and laboratories are required to immediately report cases to the Canadian Food Inspection Agency (CFIA). See [Attachment – Avian Influenza Exposures](#).

<sup>2</sup> A non-negative result is PCR positive for type A influenza and positive for H5 or H7 subtypes. Non-negative results are reported by Canadian Animal Health Laboratorians Network (CAHLN) accredited labs while only CFIA labs report a "confirmed" or "positive".

<sup>3</sup> Via confidential fax or mailbox 306-787-9576 or [cdc@health.gov.sk.ca](mailto:cdc@health.gov.sk.ca)

<sup>4</sup> Notifications may be enhanced to within 24 hours based on the pathogenicity and human health impacts of the AI virus in circulation.

<sup>5</sup> Considering the multiple agencies involved in Avian Influenza response, the local MHO may convene an initial outbreak investigation team call to collect information.

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**Public Health Purposes for Surveillance (adapted from BCCDC, 2015)**

To:

- better understand the epizootology and epidemiology of avian influenza,
- prevent potential viral re-assortment,
- prevent transmission to humans,
- facilitate early diagnosis and treatment,
- inform the development of prevention and control strategies, and
- inform efforts to contain and/or mitigate novel respiratory strains .

## **Epidemiology and Occurrence**

Avian influenza (AI) occurs worldwide and different strains are more prevalent in certain areas of the world. The World Organization for Animal Health (WOAH) requires ongoing surveillance and reporting of outbreaks. The CFIA conducts serological surveillance for highly pathogenic AI, as well as low pathogenicity H5 and H7, in commercial poultry for purposes of international trade. AI viruses do not normally infect humans, but sporadic infections have occurred, and the potential emergence of novel strains with the ability to spread easily from person to person is a public health concern.

The CFIA website<sup>6</sup> provides a summary of past Avian influenza cases and outbreaks in Canada:

- September 2007 – a single poultry farm in Saskatchewan was infected with high pathogenic avian influenza (H7N3) and was depopulated to prevent spread of the disease.
- January 2009 – low pathogenic avian influenza was isolated in British Columbia (H5N2) from two farms. All birds in the infected premise were humanely destroyed.
- November 2010 – low pathogenic avian influenza (H5N2) was identified in Manitoba on a single farm. All birds in the infected premise were humanely destroyed.

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<sup>6</sup> <https://inspection.canada.ca/animal-health/terrestrial-animals/diseases/reportable/avian-influenza/disease-incident/eng/1334851398063/1334851488454>

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- December 2014 –high pathogenic avian influenza (H5N2) was identified in British Columbia. Over the course of the HPAI H5N2 outbreak, a total of 13 premises were affected. A total of 240,000 animals were depopulated<sup>7</sup>.
- April 2015 – a highly pathogenic H5N2 AI was identified in a turkey farm in Ontario. Two additional commercial farms were found to be infected. All birds on the infected farms were depopulated and properly disposed to prevent further spread of the virus.
- 2021- 2023 – The duration and geographic spread of the current HPAI (H5N1) outbreak is unprecedented. AI (H5N1) has been detected in a wide range of wild birds and commercial poultry with increased reports of spill over to wild terrestrial and marine mammals. In Canada, over 300 premises across nine provinces have been affected with an estimated 7,184,000 birds impacted as of March 15, 2023. The latest information on current and recent AI detections by province is available on the CFIA website<sup>8</sup>.

### **Causative Agent**

AI is an infection of birds with a wide variety of clinical presentations caused by influenza A viruses. Influenza viruses, including AI, are subtyped based on 16 H (hemagglutinin) and 9 N (neuraminidase) surface protein groups. AI viruses are classified into two broad categories, low pathogenic avian influenza (LPAI) and highly pathogenic avian influenza (HPAI), based upon specific diagnostic and/or sequence criteria and severity of the illness caused in poultry in a laboratory setting. AI should not be confused with seasonal human influenza generally caused by H1 and H3 virus subtypes.

### **Symptoms**

The severity of symptoms and clinical outcome varies by the virus causing infection. Whether a virus is characterized as HPAI or LPAI in birds does not predict the effect it may have on people. For human infections with A(H7N7) and A(H9N2) viruses, disease is typically mild or subclinical. The case fatality rate for A(H5) and A(H7N9) subtype virus infections among humans is much higher than that of seasonal influenza infections.

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<sup>7</sup> Epidemiological and Evolutionary Inference of the Transmission Network of the 2014 Highly Pathogenic Avian Influenza H5N2 Outbreak in British Columbia, Canada (<https://www.nature.com/articles/srep30858>)

<sup>8</sup> <https://inspection.canada.ca/animal-health/terrestrial-animals/diseases/reportable/avian-influenza/hpai-in-canada/status-of-ongoing-avian-influenza-response/eng/1640207916497/1640207916934>

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In birds, LPAI illness is expressed as ruffled feathers, reduced egg production, or mild respiratory symptoms. HPAI involves multiple organs and tissues and can result in massive internal haemorrhaging and/or the following signs (BCCDC, 2015):

- a drop in egg production, many of which are soft-shelled or shell-less,
- diarrhea,
- haemorrhages on the hock,
- high and sudden mortality rate,
- quietness and extreme depression,
- swelling of the skin under the eyes,
- swollen and congested wattles and combs, and
- Death can occur in 48 hours and the mortality rate can approach 100%

### **Incubation Period**

Most human cases of influenza A(H5N1) have reported a history of exposure to dead or ill poultry, and the incubation period after exposure is usually 1 to 5 days and up to 9 days (Public Health Agency of Canada, 2023a) while Heymann (2022) reports an average of 2 to 5 days with a range up to 17 days.

For human infections with the A(H7N9) virus, incubation period ranges from 1 to 10 days, with an average of 5 days. For both viruses, the average incubation period is longer than that for seasonal influenza (2 days) (Heymann, 2022).

In birds, the incubation period ranges from 2 to 7 days.

### **Reservoir/Source**

All viruses can infect a great variety of birds, including wild birds, caged birds, and domestic poultry species. Waterfowl are transient latent carriers of LPAI viruses that are harbored in the intestinal tract and passed into the environment through their feces. Stable reservoirs of LPAI viruses have been recognized in wild waterfowl (BCCDC, 2015).

### **Mode of Transmission**

The mode of transmission to humans varies by the source (Public Health Agency of Canada, 2023a):

- Animal to human – transmission of the virus from infected birds, dead birds or birds' secretions (mucus, saliva) blood and feces occurs via inhalation or contact with mucus membranes (e.g., eyes, nose, mouth). There is no documented transmission
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of influenza A(H5N1) from mammals to human, though the risk of viral reassortment must be monitored as transmissibility may evolve.

- **Foodborne transmission** – There have been rare reports of human cases of avian influenza A(H5N1) possibly associated with consumption of raw or undercooked contaminated poultry products. There is no evidence that consuming fully cooked poultry, game meat or eggs could transmit influenza A(H5N1).
- **Environmental exposure** – most human cases have occurred after contact with infected poultry, however some cases have been associated with exposure to contaminated environments, such as live bird markets and poultry farms. Exposure could occur via contaminated water (inhalation, ingestion, conjunctival or intranasal inoculation).

In general, AI viruses are readily transmitted from the wild reservoir to the farm or between farms by the movement of live birds (domestic and wild), people, equipment and vehicular traffic. These viruses have not acquired the ability of sustained transmission among humans, and person-to-person transmission is rare.

### **Specimen Collection and Transport**

WHO, through its Global Influenza Surveillance and Response System (GISRS), periodically updates technical guidance protocols for the detection of zoonotic influenza in humans using molecular e.g., RT-PCR and other methods.

Animal specimens are submitted by the local veterinarian.

### **Public Health Investigation**

#### **I. Contact Investigation** (Public Health Agency of Canada, 2023a)

- Identify individuals who may have been exposed or are at risk of being exposed to AI (e.g., farm family, farm workers, visitors).
- Obtain a list of all potential individuals exposed who have entered the premises/site in the 21-day period prior to the onset of clinical signs in the birds/animals.
- **Table I-2** identifies levels of risk for individuals exposed.

#### **Contact Definition:**

An asymptomatic individual meeting the criteria for confirmed or potential avian/animal exposure to avian influenza virus.

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Potential exposure sources include (Public Health Agency of Canada, 2023b):

- infected poultry,
- under or uncooked products/parts from infected birds,
- infected wild, captive, or pet birds,
- other infected domestic or wild animals (e.g., pigs, foxes, mustelids, etc.),
- manure and litter of birds and other infected animals (can contain a high concentration of viruses),
- surfaces contaminated by bird or other infected animal's dander/body fluids or body parts (carcasses, internal organs),
- contaminated vehicles, equipment, clothing, and footwear at involved sites (e.g., infected poultry farms),
- contaminated air space (e.g., a barn when movement of birds/other infected animals or their litter/manure may have resulted in aerosolization of the virus),
- unprotected exposure to biological material (e.g., primary clinical specimens, virus culture isolates) known to contain avian influenza virus in a laboratory setting,
- not following safe handling practices when coming into contact with undercooked products/parts from infected birds/animals.

**Table I-2. Categorizing Contacts into their Risk Exposure Groups** (Public Health Agency of Canada, 2023b<sup>9</sup>)

Level of Risk	Definition
<b>High exposure risk groups</b>	<ul style="list-style-type: none"> <li>• Individuals with <i>unprotected</i> and <i>very close exposure (within 1-2 meters)</i> to a flock or group of sick or dead animals infected with AI or to particular birds that have been directly implicated in human cases (e.g., farm family member or worker who handled sick animals)</li> <li>• Individuals involved in the handling and slaughtering of live poultry and other animals, such as in a live animal market, in an affected area or visitors to an area where such activities are being undertaken while <i>unprotected</i>.</li> </ul>

<sup>9</sup> <https://www.canada.ca/en/public-health/services/publications/diseases-conditions/guidance-human-health-issues-avian-influenza.html#a8.2>

## Respiratory and Direct Contact

Section 2-65 – Influenza, avian

### Part I – Follow-up of exposures to bird or animal sources

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	<ul style="list-style-type: none"><li>• Personnel involved in handling sick animals or decontaminating affected environments (including animal disposal) as part of outbreak control efforts (e.g., cullers)<sup>10</sup> who <i>did not have, or were not wearing sufficient, or had a breach in the use of, personal protective equipment (PPE)</i> during these activities</li></ul>
<b>Moderate exposure risk groups</b>	<ul style="list-style-type: none"><li>• Individuals who handle <i>single or small groups of sick or dead animals</i> infected with AI <i>without using PPE</i> in an open air environment which is not densely populated by animals of the same species as the infected animal (e.g., single wild bird in a park)</li></ul>
<b>Low exposure risk groups</b>	<ul style="list-style-type: none"><li>• Personnel involved in culling <i>non-infected or likely non-infected</i> animal populations as a control measure (e.g., those exclusively culling asymptomatic animals in a control area outside of the infected and primary control zones)</li><li>• Individuals who handle (i.e., have direct contact) with <i>asymptomatic animals</i> that may be infected with AI based on species and possibly proximity to a geographic area where AI has recently been identified (e.g., hunters, trappers, bird banders, Indigenous hunters and harvesters)</li><li>• Personnel involved in handling sick animals or decontaminating affected environments (including animal disposal) as part of outbreak control efforts (e.g., cullers) who <i>were using sufficient PPE</i> during these activities</li></ul>

The extent of investigation for individuals exposed to infected animals is dependent on the extent of illness and specific organism and will be directed by the MHO. See [Attachment – Sample Contact Management Form.](#)

In addition to reviewing the epidemiology of the outbreak, the following considerations will inform the risk assessment and management of human contacts:

- Degree of certainty the flock has been infected with AI;
- Human health risk based on the subtype;

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<sup>10</sup> CFIA occupational health and safety is responsible for follow up and monitoring personnel employed by the CFIA involved in culling and other outbreak control activities

- Observation of human illness linked to the current outbreak and their severity of illness;
- Timing of implementation of control measures;
- Individual risk factors in the exposed individuals (e.g., immunocompromised);
- Level of confidence that public health recommendations are being followed; and
- Number of cases/contacts.

### **Public Health Interventions**

Details on exposure assessment, management of contacts, and infection control can be found at: <https://www.canada.ca/en/public-health/services/publications/diseases-conditions/guidance-human-health-issues-avian-influenza.html> and <https://www.who.int/publications/i/item/who-guidance-on-public-health-measures-in-countries-experiencing-their-first-outbreaks-of-h5n1-avian-influenza>.

### **Education**

Provide information on disease, transmission and infection prevention and control measures, and environmental cleaning. Refer to [Avian Influenza Fact Sheet](#) for details.

- Provide advice on minimizing further exposure (maintaining physical distance from others, practice respiratory etiquette, wearing a well-constructed and well-fitting mask when physical distancing is not possible). Public transportation should not be used when seeking testing.
- Those involved in the care, culling, or cleaning up of infected birds or their environments should wear appropriate PPE and follow the biosecurity measures outlined by the CFIA.
- Individuals, particularly producers whose flocks have been impacted, may require assistance in determining where to access mental health supports.

### **Communication**

- Letters can be used to inform contacts of the exposure, symptom monitoring and when to seek medical attention (see [Attachment – Template Exposure Letter](#)).

### **Symptom Monitoring**

- Individuals should be advised to self-monitor for the development of fever, respiratory symptoms, and/or conjunctivitis (eye infection) for 10 days after the last exposure to a known or suspected source of AI virus or a contaminated environment.



- Individuals should avoid the use of fever-reducing medications e.g., acetaminophen, ibuprofen) as much as possible as it may mask onset of fever;
  - Signs and symptoms may include fever (temperature of 100°F [37.8 degrees C] or greater) or feeling feverish, cough, sore throat, runny or stuffy nose, muscle or body aches, headaches, fatigue, eye redness (or conjunctivitis), shortness of breath or difficulty breathing. Fever may not always be present. Less common signs and symptoms are diarrhea, nausea, vomiting, or seizures (US CDC, March 2022).
- If they develop symptoms, they should isolate, notify public health, seek testing and be managed as a suspect novel influenza case according to infection prevention and control measures.
- CFIA occupational health and safety is responsible for monitoring personnel employed by the CFIA involved in culling and other outbreak control activities. Notification of illness to local MHO shall occur when illness is identified.

### Isolation/Exclusion

- Provide advice on restriction of movement of contacts - this includes recommendations not to visit other farms, to avoid serving as a vehicle for the spread of contaminated materials.
- Contacts should also avoid interactions with individuals at higher risk for severe illness, high risk settings, and large gatherings for 10 days following last exposure (BCCDC, 2022).
- More strict quarantine measures would be considered if the outbreak involved a virus that was causing severe illness in humans or there was evidence that it could be spread efficiently from person to person (Interim H5N1 Avian Influenza Outbreak, November 2022, BCCDC).

### Testing

- Testing of asymptomatic contacts may be requested by the Public Health Agency of Canada (PHAC).
- Testing is recommended for contacts who develop signs and symptoms. Refer to [Part II](#).

### Immunization

- Review immunization history and during periods of human influenza activity (i.e., “influenza season”), contacts who have not received the most recent seasonal
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influenza vaccine should be offered vaccine. See [Prevention Measures – Immunization](#).

### Prophylaxis

- The current objective for antiviral use is to minimize the direct risk and impact of zoonotic infection. In conjunction with other measures, antiviral prophylaxis may also reduce the risk of the emergence of a virus with pandemic potential<sup>11</sup>.
- Refer to [Table I-3](#) for a summary on the management of contacts based on risk including antiviral prophylaxis recommendations in conjunction with [Table I-2](#). Exposure Risk Categorization.
- Prophylaxis may be recommended based on the human health risk assessment at the direction of the Ministry based on technical guidance provided by PHAC.

#### **Antivirals for Post-Exposure Prophylaxis**

*If post-exposure antiviral chemoprophylaxis is initiated:*

- *It should begin as soon as possible (within 48 hours) after the first exposure to the confirmed or probable case.*
- *The dosing and frequency aligns with the treatment dosing for the neuraminidase inhibitors oseltamivir or zanamivir (i.e. **one dose twice daily**) is recommended in these instances instead of the typical antiviral chemoprophylaxis regimen (once daily).*
- *The course of antiviral use should be continued for 7 or 10 days (5 days for a time-limited exposure and 10 days for ongoing exposures).*
- *Refer to AMMI guidelines or specific dosage recommendations by age group.*

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<sup>11</sup> PHAC, 2023b <https://www.canada.ca/en/public-health/services/publications/diseases-conditions/guidance-human-health-issues-avian-influenza.html>

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**Table I-3. Summary Table for Management of Contacts based on Risk** (Public Health Agency of Canada, 2023b)

		Public Health Intervention	Exposure Risk		
			Low Risk Groups	Moderate risk groups	High risk groups
Human illness risk <sup>12</sup>	<b>Subtype has previously been identified and is not known to have caused human illness</b> (e.g., H6N1, H13N6)	Monitoring	Self-monitor	Self-monitor	Self-monitor
		Testing	If develop s/s	If develop s/s	If develop S/s
		Prophylaxis	No	No	Consider offering prophylaxis
	<b>Subtype is known to cause predominantly mild human illness</b> (e.g., H3N8, H7N3, H7N7, H9N2)	Monitoring	Self-monitor	Self-Monitor	Active <sup>13</sup>
		Testing	If develop s/s	If develop s/s	If develop S/s
		Prophylaxis	No	Consider offering <sup>14</sup>	Offer Prophylaxis
	<b>Subtype is known to cause predominantly severe human illness</b> (e.g., H5N1, H5N6, H7N9)	Monitoring	Self-monitor	Self-monitor	Active
		Testing	If develop s/s	If develop s/s	If develop s/s or if requested by PHAC.
		Prophylaxis	No	Offer	Offer

<sup>12</sup> If there are no data available on the human illness risk for the strain/subtype for the virus identified, antiviral prophylaxis is not recommended unless implementation of an early antiviral treatment cannot be ensured (e.g., if the worker may not be accessible or able to access medical services in the 10 days following their last exposure). The need for antiviral prophylaxis could be reassessed if culling was indicated (Public Health Agency of Canada, 2023b).

<sup>13</sup> Stricter measures (e.g., active daily monitoring of contacts) could be considered if the outbreak involves a virus that is causing severe illness in humans or there is evidence that it could be transmitted from person to person. The public health authority may also decide on more active monitoring of contacts depending on:

- the epidemiology of the outbreak (e.g., if the avian virus is highly pathogenic to human cases or is currently or previously known to cause severe illness in humans),
- the intensity and duration of exposure,
- familiarity with the strain causing the outbreak, and
- the level of confidence that public health recommendations will be followed by the contacts.

<sup>14</sup> Prophylaxis should be considered for individuals with pre-existing medical conditions that put them at higher risk of complications from influenza.

## II. Environment

### **Personal Protective Measures**

It is important for individuals to take appropriate [personal protective measures](#) and to use appropriate protective equipment when handling unknown animals or animals that are seemingly unwell. Standards exist for veterinarians and other occupational groups to prevent exposure to zoonotic illnesses. CFIA outlines [Avian Biosecurity measures](#).

### **Workplace and Animal Control Measures**

The Ministries of Labour Relations and Workplace Safety and Agriculture as well as the CFIA regulate and advise on workplace and animal control measures:

- Strict biosecurity measures on poultry farms including keeping wild birds away, sanitation of poultry houses and equipment, and proper disposal of dead birds and manure; routine surveillance and outbreak management are the key measures in prevention of AI spread among poultry.
- The CFIA is responsible for the administration and enforcement of the *federal Health of Animals Act and Regulations*. HPAI subtypes H5 and H7, regardless of pathogenicity, are immediately notifiable to the CFIA. CFIA will conduct disease control activities, which may include depopulation of infected birds and other control measures as required.
- The province, including the Ministry of Agriculture (MoA), supports the federal government in response to AI. The MoA support can include diagnosing, monitoring and assisting in controlling and preventing the disease in the province. It supports diagnostic testing of animal samples on a routine basis and coordinates with CFIA for the confirmation of AI positive samples.
- Occupational Health and Safety for CFIA is responsible for monitoring human health among exposed workers. If human illness is reported, the MHO shall be notified.

## III. Outbreak Measures

The CFIA is the lead authority for monitoring, control and eradication of foreign animal diseases in Canada, including AI. The provincial MoA provides support to the CFIA for a coordinated animal disease emergency response to an outbreak, including notifying Saskatchewan Public Safety Agency (SPSA) and collaborating with CFIA to support outbreak response activities in the province. Roles and responsibilities are outlined in the Terrestrial Animal Disease Emergency Support Plan.

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In the event of an animal disease outbreak:

- Ministry of Health will:
  - Determine the public health risk and impact, and advise CFIA, SPSA and MoA accordingly;
  - Collaborate with PHAC, the CFIA and local public health units to coordinate case and contact management of specific human cases;
  - Convene the One Health Management Team, including CFIA and occupational health and safety (OHS), as appropriate; and
  - Where applicable, assess and advise on the public health risk associated with destruction, disposal and disinfection activities.
  
- Local Medical Health Officer will:
  - Establish communication pathways for reporting illness among human contacts;
  - Investigate suspect AI outbreaks;
  - Obtain information about contacts from premises owner and/or CFIA – refer to the *Public Health Act* for authority to require CFIA and OHS to share information about contacts, including number of contacts being monitored and if symptomatic;
  - Provide guidance and ensure monitoring, prophylaxis and testing for contacts, as appropriate;
  - Monitor human health impacts through ongoing surveillance activities (e.g., laboratory testing of suspect cases, syndromic respiratory surveillance systems, etc.); and
  - Provide guidance for local public health teams and other health partners on response strategies, such as recommendations on occupational health and safety and infection prevention and control measures for health workers.

#### **IV. Pandemic Measures**

See local, provincial, national pandemic plans.

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## Prevention Measures

### Immunization

- The current human influenza vaccines do not protect against AI; however, the seasonal influenza vaccine can potentially reduce the possibility of co-infection with avian and human influenza viruses and complications that may arise.
- Promote seasonal influenza vaccine for individuals involved in poultry industry or who may come in contact with migratory birds.

### Avian/Animal Surveillance:

Canada currently monitors for AI through<sup>15</sup>:

- Wild bird surveillance;
- Passive surveillance in domestic poultry when clinical signs suggestive of notifiable avian influenza are reported;
- Targeted surveillance when notifiable AI is detected;
- Pre-slaughter surveillance in commercial poultry (chickens and turkeys);
- Hatchery supply flock surveillance; and
- Voluntary enhanced surveillance in the poultry genetic exporters sector.

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<sup>15</sup> <https://inspection.canada.ca/animal-health/terrestrial-animals/diseases/surveillance/avian-influenza-surveillance/eng/1329693810008/1329694298513>

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**Revisions**

Date	Change
November 2023	<p>Reformatted the chapter to include Part I – Follow up of exposures to bird or animal sources and Part II – Follow-up of human infections with avian influenza.</p> <p>Notification timeline - clarified the role of CCWHC and Environment.</p> <p>Updated Epi and Occurrence section to reflect the ongoing H5N1 cases in birds and other animals.</p> <p>Updated incubation period for H5N1 based on 2023 PHAC reference and Heymann.</p> <p>Mode of transmission updated to provide categories of animal to human, foodborne, environmental exposures.</p> <p>Reformatted Public Health Investigation.</p> <p>Clarified the contact definition categorizations and specified the monitoring and testing recommendations based on exposure risk.</p> <p>Updated prophylaxis recommendations to align with PHAC 2023 document.</p>
June 29, 2022	Included link to Avian Influenza Fact sheet in Education section.
May 2022	New

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**Notification Timeline for Human Cases of Avian Influenza:**

**From Lab/Practitioner to Public Health:** Within 24 hours.

**From Public Health to Ministry of Health:** Within 24 hours.

**From Ministry of Health to Public Health Agency of Canada:** Within 24 hours.

**Public Health Follow-up Timeline:** Within 24 hours.

**Public Health Purpose for Management of Contacts to Human Cases of Highly Pathogenic Avian Influenza (HPAI)**

- Human illness following exposure to HPAI is uncommon and the risk for a pandemic strain of novel influenza is heightened if human-to-human transmission occurs. The public health purpose for contact follow-up is therefore conducted to:
  - prevent further spread of novel influenza A viruses associated with HPAI if there are infected persons in Saskatchewan/Canada;
  - understand human-to-human transmission risks of HPAI novel influenza;
  - monitor the impact of antivirals or other therapeutics;
  - provide an early warning mechanism in order that available control measures may be implemented at the appropriate time to minimize transmission;
  - inform efforts at containment and/or mitigation of this novel respiratory pathogen;
  - inform risk assessment by growing the evidence base on human infection risk and spectrum of illness, including asymptomatic or atypical;
  - track epidemiology trends of novel influenza in Saskatchewan including risk factors and distribution; and
  - inform the public and medical community about novel influenza.
- To fulfill *International Health Regulation* requirements of reporting occurrences of novel influenza.

## Surveillance Case Definition

**Table II-1. Human Infections with Avian Influenza A(H5N1) (Public Health Agency of Canada, July 2023)**

<b>Confirmed</b>	➤ A person with laboratory confirmation of influenza A(H5N1) infection at Canada's National Microbiology Laboratory (NML).
<b>Probable<sup>16</sup></b>	➤ A person who has influenza A results suggestive of a non-seasonal influenza strain pending confirmatory test results by the NML and/or the provincial/territorial public health laboratory AND ➤ meets the exposure criteria <sup>a</sup> , regardless of symptoms, OR ➤ has symptoms compatible with the illness criteria <sup>b</sup> .
<b>Person under investigation</b>	➤ A person meeting the exposure criteria <sup>a</sup> , with or without symptoms that are compatible with illness criteria <sup>b</sup> , who is positive for influenza A and for whom subtyping laboratory test results are unknown or pending

<sup>a</sup> Exposure within the previous ten (10) days to any of the following:

- direct or indirect close contact (within 2 metres) to presumptive/confirmed infected birds or other animals (e.g., visiting a live market, touching or handling infected animals, under- or uncooked poultry or egg)
- close contact (within 2 metres) with a person under investigation, probable, or confirmed human case,
- unprotected exposure to biological material (e.g., primary clinical specimens, virus culture isolates) known to contain avian influenza virus in a laboratory setting, or
- unprotected, direct or close contact (within 2 metres) to contaminated environments. Contaminated environments includes direct contact with surfaces contaminated with animal parts (e.g., carcasses, internal organs) or feces from A(H5N1) infected animals or settings in which there have been mass animal die offs in the previous six weeks due to A(H5N1). This period is based on limited evidence from experimental studies. There is insufficient evidence regarding other factors potentially affecting virus survivability, such as temperature, airflow, type of surface material and fallow period.

<sup>b</sup> An illness compatible with influenza virus infection (fever >38 degrees Celsius, and new onset of (or exacerbation of chronic) cough or breathing difficulty and evidence of severe illness progression. ILI is defined as acute onset of respiratory illness with fever and cough and one or more of the following: sore throat, arthralgia, myalgia or prostration, which could be due to influenza virus. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent. If the index of suspicion is high and depending on clinical judgement, individuals with the following additional signs and symptoms may also be considered as meeting illness criteria: rhinorrhea, fatigue, headache, conjunctivitis, shortness of breath or difficulty breathing, pneumonia, diarrhea, respiratory failure, acute respiratory distress syndrome, neurologic symptoms, or multi-organ failure. The variation in spectrum of illness ranges from mild, atypical to severe. Conjunctivitis symptoms may also be present (red eye, eyelid/ conjunctiva inflammation (swelling), tearful eye, itching eye, painful eye, burning eye, discharge from eye, or sensitivity to light).

<sup>16</sup> A positive non-seasonal influenza A test is appropriate when there is no alternative etiologic hypothesis. For example, an individual who meets the exposure and/or illness criteria and is positive for influenza A and is negative for A(H1) and A(H3) should be included in this definition of a probable case. However, an individual who tests positive for influenza A and an H3 infection is not a probable case.

<b>Outbreak in humans</b>	A human avian influenza outbreak is defined as at least one probable or confirmed case of human influenza A of a known or novel avian sub-type or a cluster of probable or confirmed cases related to the same exposure source.
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## Information

### Symptoms

Clinical illness among *humans* caused by influenza A(H5N1) has been rarely reported and has occurred predominantly in children and young adults. Infections in humans mainly manifest with respiratory symptoms ranging from conjunctivitis (i.e., red eyes with discharge) to influenza-like illness (i.e., fever, headache, sore throat, myalgia, shortness of breath) to severe respiratory illness (e.g., pneumonia, acute respiratory distress, viral pneumonia). Nausea, diarrhea, vomiting and neurological signs may occur.

### Mode of Transmission

- Human to human – limited human to human transmission of influenza A(H5N1) (e.g., close physical contact such as within a household) has been suggested in previous outbreaks but sustained human to human transmission of influenza A(H5N1) has never been observed (Public Health Agency of Canada, 2023a).

### Period of Communicability

Person-to-person transmission of AI viruses has been reported rarely (US CDC, 2022). Detailed public health investigations are required to determine whether person-to-person transmission has occurred.

### Specimen Collection and Transport

Specimen collection types to be considered include: nasopharyngeal swab, throat swab, sputum, bronchoalveolar lavage, and endotracheal secretions.

- While nasopharyngeal swabs are the primary specimen type for seasonal influenza viruses, based on experiences with the pandemic H1N1 and avian influenza infections, multiple specimen types should be collected in cases of severe respiratory infection with a negative nasopharyngeal swab.

**Table II-2. Interpretation of Test Results**

Results from NAAT/RT-PCR are reported as:	Interpretation as per Case Definition	Test Details:
Positive	Confirmed	Influenza A (or B) virus detected
Presumptive positive	Does not meet case definition	Testing will be repeated at a reference lab (i.e. RRPL or NML).
Indeterminate	Does not meet case definition	Virus is detected below the limit of detection of the assay. Recommend collection of new specimen for repeat testing.
Invalid	Does not meet case definition	Specimen failed Quality Control or exhibited non-specific amplification. Recommend recollection of new specimen for repeat testing.
Negative	Not a Case	No Influenza A (or B) virus detected.

- Source: RRPL December 6, 2022

Refer to [Attachment - Influenza Documentation in Panorama](#) for guidance on documenting in Panorama.

**Treatment/Supportive Therapy**

*Treatment for clinical management is at the discretion of the primary care provider. The following serves as a reference for the public health investigator:*

- *Antiviral treatment is recommended as soon as possible for outpatients and hospitalized patients who are suspected (cases under investigation), probable, or confirmed cases of human infection with novel influenza A (including avian or swine influenza) viruses associated with severe human disease ([CDC](#), March 2022).*
- *Refer to Association of Medical Microbiology and Infectious Disease Canada (AMMI) guidelines on the use of antivirals (<http://www.amm.ca/guidelines/>).*
- *Antibiotic therapy is not indicated unless bacterial complications arise.*
- *Because of the association with Reye’s syndrome, salicylates (e.g., Aspirin) should be avoided in children with influenza.*

## **Public Health Investigation**

Based on Public Health Agency of Canada (2023a).

### **I. Cases**

Assess for the source including history of travel, contact to a known case or exposure to birds, animals or contaminated environments.

Assess for contacts.

### **Public Health Interventions**

#### **Communication**

- Confirmed and probable human cases of avian influenza A(H5N1), irrespective of illness symptoms or severity, must be reported by the Ministry of Health to Public Health Agency of Canada within 24 hours of notification.

#### **Education**

- All individuals should be provided information on AI and who to call and where to go if illness becomes more severe.
- provide information on preventing infection spread to other household contacts (e.g., respiratory etiquette, hand hygiene, etc.). See Exclusion and Isolation below

#### **Exclusion and Isolation**

- All individuals should stay home when sick.
- In a household setting, individuals should strive to reduce exposures by:
  - avoiding shared air spaces;
  - eliminating direct contact with the case or with their infectious fluids;
  - eliminating close range conversations with the case;
  - avoiding use of shared spaces;
  - eliminating use of shared items; and
  - wearing masks when outside of room.
- See [Epidemic Measures](#).
- For additional information on infection prevention and control measures for individuals in health care facilities – refer to Regional Infection Control Manual.
- Health Care Workers (HCWs) – refer to Regional Management of Employees and Other Health Care Workers during Influenza Outbreaks in Health Care Facilities.

#### **Immunization**

Offer relevant immunizations if eligible.

**Monitoring**

- Conduct active surveillance and document course of illness. The frequency of active surveillance should be determined by the public health authority with consideration given to reasonable resource allocation and severity of the illness.
- The need for public health follow-up after discharge from the hospital will depend on whether the illness has completely resolved upon discharge, and on the presence of any other individual risk factors that may influence the period of communicability.

**II. Contacts****Table II-3. Contact Definition:**

<p>Close contacts are defined as persons:</p> <ul style="list-style-type: none"> <li>• within approximately 2 meters (6 feet) of a confirmed or probable novel influenza A caused by Highly Pathogenic Avian Influenza case-patient for a prolonged period of time (e.g. 15 minutes), OR</li> <li>• individuals who have also occupied the same area for a prolonged period of time (e.g. 15 minutes), OR</li> <li>• who had direct contact with infectious secretions of a confirmed or probable case while they were likely to be infectious (beginning 1 day prior to illness onset and continuing until resolution of illness). See <b>Table II-4</b> for Exposure Risk stratifications.</li> </ul>
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**Table II-4. Exposure Risk Groups** (Public Health Agency of Canada, 2023b)

Level of Risk	Definition
<b>Moderate exposure risk groups</b>	<ul style="list-style-type: none"> <li>• Household/family contacts of a suspected or confirmed human AI patient (defined as living under the same roof as the index case for <math>\geq 24</math> hrs within the period when the case is presumed to be contagious).</li> <li>• HCWs (i.e., those working in a setting where health care is being provided) who had no, or insufficient, PPE in place when in close contact (i.e., within 1 to 2 meters) of a strongly suspected or confirmed human AI case, or 2) in direct contact with respiratory secretions or other potentially infectious specimens from the case.</li> <li>• HCWs or laboratory personnel who might have unprotected contact (i.e., did not have or was wearing insufficient PPE) with specimens/secretions which may contain virus or with laboratory isolates.</li> </ul>
<b>Low exposure risk groups</b>	<ul style="list-style-type: none"> <li>• HCWs who used appropriate PPE during contact with human AI cases (i.e., in the absence of significant human to human transmission).</li> <li>• HCWs not in close contact (i.e., distance greater than 1 metre) with</li> </ul>

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	<p>suspected or confirmed human AI cases and having no direct or indirect contact with infectious material from that case(s).</p> <ul style="list-style-type: none"><li>• Laboratory personnel working with the influenza virus using appropriate laboratory procedures and infection control precautions.</li></ul>
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## Public Health Interventions

### Education

- Contacts of human cases should be informed of their exposure (potential or actual). For example, letters can be sent to group setting where cases attended to inform them of the exposure, symptom monitoring and when to seek medical attention.
- Explain signs and symptoms and required monitoring expectations, risk mitigation measures and to isolate if they develop any symptoms and contact public health for further direction.
- Provide information on preventing infection spread to other household contacts, e.g., limiting close and direct contact with others (i.e., designating one caregiver), wear a well-constructed and well-fitting mask, respiratory etiquette, physical distancing, improving ventilation, hand hygiene, cleaning of high-touch surfaces and household items etc.

### Exclusion

- Self-isolate as quickly as possible should symptoms develop, and contact the local public health office for further direction.
- Contacts who remain asymptomatic can be permitted to continue routine daily activities (e.g., go to work, school).
- High- or moderate-risk exposures should avoid contact with high-risk settings and vulnerable people during their monitoring period if possible.

### Monitoring

- All close contacts should self-monitor for 10 days following their last exposure to an individual with confirmed or probable infection with novel influenza of highly pathogenic avian influenza source. This includes daily assessment of:
  - Temperature recording
  - Presence of symptoms
- Individuals should be advised to avoid fever-reducing medications (acetaminophen, ibuprofen and ASA) that may mask early symptoms.
- Individuals with symptoms should be managed as a case and should be isolated at home except to seek medical care and advised to avoid contact with other persons and animals until their illness is resolved. This is to prevent infection transmission,

but also because humans and animals can be sources of other strains of influenza and contact could allow opportunities for viral recombination/reassortment.

**Testing**

- Symptomatic close contacts with any illness symptoms (an elevated temperature, or new respiratory symptoms [cough, sore throat, shortness of breath, difficulty breathing]) should be promptly tested for novel influenza A virus infection.
- It is recommended that multiple clinical specimens are collected (Heymann, 2022).
  - Ensure the lab is notified if an individual is being tested because they are suspected of avian influenza so additional biosafety precautions can be implemented as necessary. The lab will expedite typing in the event of positive results.

**Chemoprophylaxis**

**Table II-5. Recommendations for Antiviral Chemoprophylaxis of Asymptomatic Close Contacts to Human case of HPAI (US Center for Disease Prevention and Control, March 2022)**

Level of Risk	Definition	Recommendation
<b>Highest Risk exposure group (recognized risk of transmission)</b>	<ul style="list-style-type: none"> <li>• See Table II- 4</li> </ul>	Oral oseltamivir or inhaled zanamivir chemoprophylaxis should be provided to close contacts of a confirmed or probable novel influenza A case-patient according to risk of exposure.  <b>Chemoprophylaxis should be administered</b> as soon as possible (within 48 hours) after the first exposure. Dosing is one dose <i>twice</i> daily.
<b>Moderate Risk exposure group (unknown risk of transmission)</b>	<ul style="list-style-type: none"> <li>• See Table II-4</li> </ul>	<b>Chemoprophylaxis may be considered.</b>
<b>Low Risk Exposure groups (transmission unlikely)</b>	<ul style="list-style-type: none"> <li>• See Table II-4</li> </ul>	<b>Chemoprophylaxis is not routinely recommended.</b>

Decisions to initiate antiviral chemoprophylaxis for persons in moderate- and low-risk exposure groups should be based on clinical judgment, with consideration given to the type of exposure and to whether the close contact is at higher risk for complications from influenza.

- If post-exposure antiviral chemoprophylaxis is initiated:



- It should begin as soon as possible (within 48 hours) after the first exposure to the confirmed or probable case;
- The dosing and frequency aligns with the treatment dosing for the neuraminidase inhibitors oseltamivir or zanamivir (i.e. one dose twice daily) is recommended in these instances instead of the typical antiviral chemoprophylaxis regimen (once daily) (US CDC, 2022).
- The course of Antiviral use should be continued for 5 or 10 days (5 days for a time-limited exposure and 10 days for ongoing exposures).

### **Immunization**

- Review immunization history for contacts. Offer seasonal influenza vaccination for individuals that have not already been vaccinated.
- The current human influenza vaccines do not protect against AI; however, the seasonal influenza vaccine can potentially reduce the possibility of co-infection with avian and human influenza viruses and complications that may arise.

**Revisions**

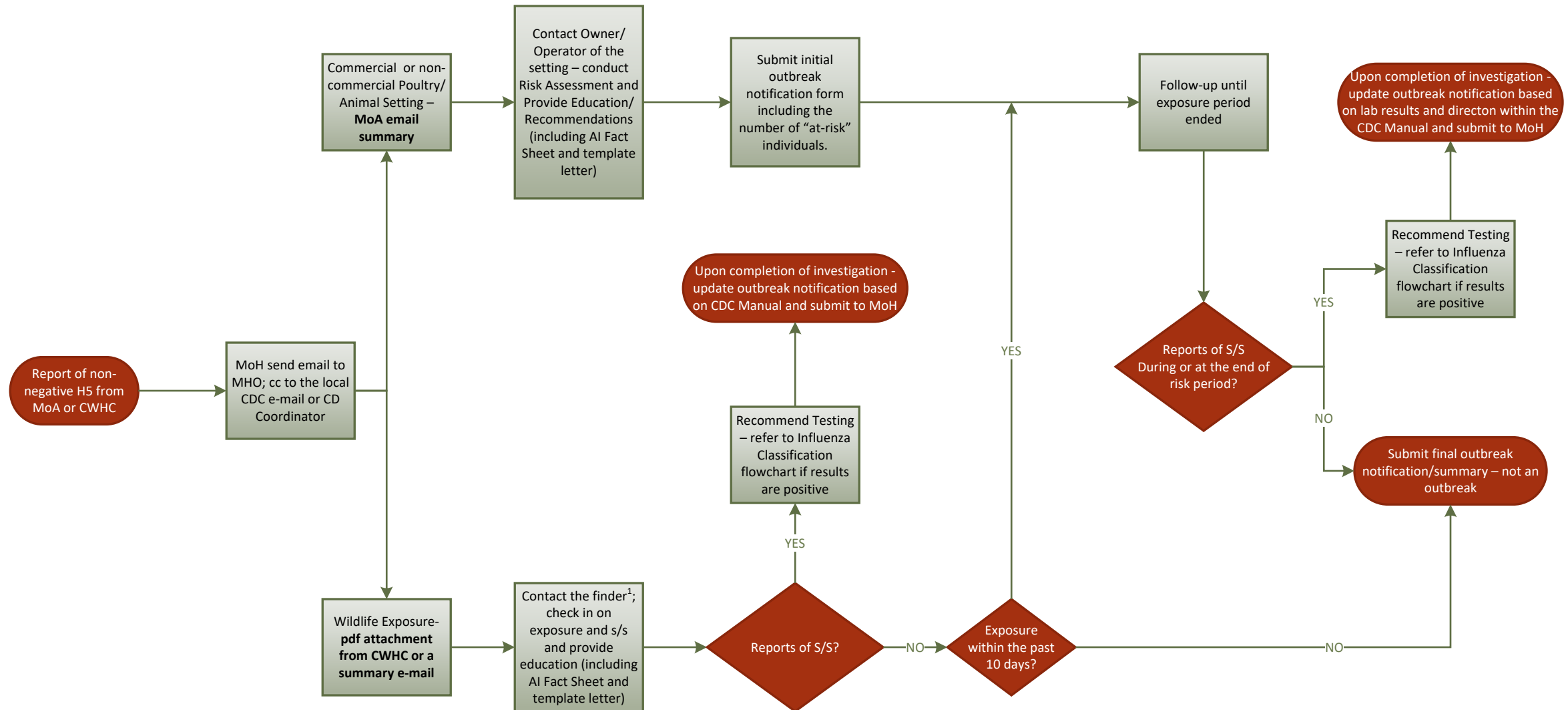
<b>Date</b>	<b>Change</b>
November 2023	Removed Avian influenza details from Influenza chapter and embedded all aspects of Human cases of Avian influenza into this chapter. Adjusted contact definition.

## Reference

Public Health Agency of Canada (2023a). Avian influenza A(H5N1): For health professionals. Retrieved April, 2023 from <https://www.canada.ca/en/public-health/services/diseases/avian-influenza-h5n1/health-professionals.html>

Public Health Agency of Canada (2023b). Human health issues related to avian influenza in Canada. Retrieved Aug, 2023 from <https://www.canada.ca/en/public-health/services/publications/diseases-conditions/guidance-human-health-issues-avian-influenza.html>

Public Health Agency of Canada (July 2023). National case definitions: Human infections with avian influenza A(H5N1) virus. Retrieved September 2023 from <https://www.canada.ca/en/public-health/services/diseases/avian-influenza-h5n1/health-professionals/national-case-definition.html>



<sup>1</sup> the finder is generally the individual who had close contact with the animal. The submitter is often an individual from an wildlife rehabilitation facility. If the submitter is not a wildlife rehabilitation facility, contact both the finder and the submitter to assess their exposure, etc.

### Non-STBBI and Non-VPD Contact Line List/Worksheet

**Contact Line List/Worksheet**

Investigation ID# \_\_\_\_\_ Index Client ID# \_\_\_\_\_

Organism: \_\_\_\_\_

Communicable Period dates: from \_\_\_\_\_ to \_\_\_\_\_

Page: \_\_\_\_ of \_\_\_\_

Prophylaxis criteria: \_\_\_\_\_

Uploaded to Panorama Index case investigation by \_\_\_\_\_ on \_\_\_\_\_.

Name of Individual or Group (sport team, school, etc)	Demographics	Contact Type & dates	History	Exclusion	Symptoms / Info Provided	Treatment/ Proph/ Testing	Comments	PHN	Contact Inv ID# (optional):	Referred to org:
Occupation: Guardian/Coach: # on team/in group _____	Address Phone email Age DOB HSN	<input type="checkbox"/> Household <input type="checkbox"/> School/daycare <i>list:</i> <input type="checkbox"/> Other: <b>Date of last contact:</b>	<input type="checkbox"/> Immunocompromised Meds: <input type="checkbox"/> Medical disorder(s) <input type="checkbox"/> Allergies:	<input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Daycare <input type="checkbox"/> Preschool	<input type="checkbox"/> Symptoms (specify):  <input type="checkbox"/> None <input type="checkbox"/> Education/Counselling <i>Date:</i>	<input type="checkbox"/> Treatment/Prophylaxis Advised specify:  <input type="checkbox"/> Not Advised <input type="checkbox"/> Testing Advised <input type="checkbox"/> Req given	MHO Consulted:			
Occupation: Guardian/Coach: # on team/in group _____	Address Phone email Age DOB HSN	<input type="checkbox"/> Household <input type="checkbox"/> School/daycare <i>list:</i> <input type="checkbox"/> Other: <b>Date of last contact:</b>	<input type="checkbox"/> Immunocompromised Meds: <input type="checkbox"/> Medical disorder(s) <input type="checkbox"/> Allergies:	<input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Daycare <input type="checkbox"/> Preschool	<input type="checkbox"/> Symptoms (specify):  <input type="checkbox"/> None <input type="checkbox"/> Education/Counselling <i>Date:</i>	<input type="checkbox"/> Treatment/Prophylaxis Advised specify:  <input type="checkbox"/> Not Advised <input type="checkbox"/> Testing Advised <input type="checkbox"/> Req given	MHO Consulted:			
Occupation: Guardian/Coach: # on team/in group _____	Address Phone email Age DOB HSN	<input type="checkbox"/> Household <input type="checkbox"/> School/daycare <i>list:</i> <input type="checkbox"/> Other: <b>Date of last contact:</b>	<input type="checkbox"/> Immunocompromised Meds: <input type="checkbox"/> Medical disorder(s) <input type="checkbox"/> Allergies:	<input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Daycare <input type="checkbox"/> Preschool	<input type="checkbox"/> Symptoms (specify):  <input type="checkbox"/> None <input type="checkbox"/> Education/Counselling <i>Date:</i>	<input type="checkbox"/> Treatment/Prophylaxis Advised specify:  <input type="checkbox"/> Not Advised <input type="checkbox"/> Testing Advised <input type="checkbox"/> Req given	MHO Consulted:			
Occupation: Guardian/Coach: # on team/in group _____	Address Phone email Age DOB HSN	<input type="checkbox"/> Household <input type="checkbox"/> School/daycare <i>list:</i> <input type="checkbox"/> Other: <b>Date of last contact:</b>	<input type="checkbox"/> Immunocompromised Meds: <input type="checkbox"/> Medical disorder(s) <input type="checkbox"/> Allergies:	<input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Daycare <input type="checkbox"/> Preschool	<input type="checkbox"/> Symptoms (specify):  <input type="checkbox"/> None <input type="checkbox"/> Education/Counselling <i>Date:</i>	<input type="checkbox"/> Treatment/Prophylaxis Advised specify:  <input type="checkbox"/> Not Advised <input type="checkbox"/> Testing Advised <input type="checkbox"/> Req given	MHO Consulted:			

Please see the following pages for the Letter Template Notification of an Exposure to Avian Influenza.

<DATE>

<NAME>

<ADDRESS>

<CITY SK POSTAL CODE>

**Re: Avian Influenza – Monitoring Following an Exposure**

Dear <NAME >

You have received this letter because you were recently exposed to avian influenza virus on <DATE>. Influenza viruses that infect birds are called avian influenza, or “bird flu” viruses. These viruses have the potential to cause human illness in people who have been exposed to infected birds such as having close contact with infected live or dead poultry, or contaminated environments. Avian influenza viruses may cause illness in humans ranging from mild (e.g., eye infections, cough, sore throat) to severe (e.g., pneumonia, shortness of breath, difficulty breathing).

Because human infections are possible, all people with **direct or close exposure to infected well-appearing, sick, or dead birds, infected flocks, contaminated surfaces or other infected animals** should be monitored for illness for 10 days after their last exposure.

Please self-monitor for the following signs of illness **for 10 days** after your last exposure:

- Fever (Temperature of 37.8°C or greater) or feeling feverish/chills
- Respiratory symptoms (cough, sore throat, difficulty breathing/shortness of breath, etc)
- Eye symptoms (redness, irritation, tearing or discharge)
- Runny or stuffy nose
- Other flu-like symptoms (muscle or body aches, headaches, fatigue, etc)
- Diarrhea

**If symptoms develop:**

- Notify the local public health unit immediately <PUBLIC HEALTH PHONE NUMBER>.
- They will advise you on how to seek immediate testing. Inform your health care provider of your exposure to avian influenza (take this letter with you to see your physician).
- Treatment with an antiviral is most effective if given within 48 hours of onset of symptoms so see your physician right away.
- Except for visiting your physician, stay home and minimize contact with others. You should continue to minimize contact with others until you have been 24 hours without a fever.

Thank you for your cooperation during this period. We appreciate your assistance in preventing the possible spread of infection. Please see the attached fact sheet for more information and feel free to call <PUBLIC HEALTH PHONE NUMBER> as needed.

As this may be a stressful time, please reach out to further supports as needed such as:  
<https://www.wellnesstogether.ca/en-CA?lang=en-ca> or  
<http://www.farmstressline.ca/resources> or call 811 for other information on accessing mental health supports.

Sincerely,

<NAME OF PUBLIC HEALTH DESIGNATE>

<TITLE>

cc: Medical Health Officer

Attachment: Avian Influenza Fact Sheet