

---

---

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

**The Ministry of Agriculture to Ministry of Health<sup>2</sup>:** Within 1 business day

**The Ministry of Environment to Ministry of Health<sup>2</sup>:** Within 1 business day

**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:**

**Reporting symptomatic contacts (i.e suspect cases, Refer to Section 2-60 Influenza):**

Within 24 hours

**Public Health Follow-up Timeline:** Initiate within 24-48 hours.

### 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, and
- inform the development of prevention and control strategies.

---

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

---

---

## Epidemiology and Occurrence

Avian influenza (AI) occurs worldwide and different strains are more prevalent in certain areas of the world than others. The World Organization for Animal Health (OIE) 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>3</sup> provides a summary of Avian influenza cases and outbreaks in Canada:

- September 2007 – a single poultry farm in Saskatchewan was infected with high pathogenic avian flu (H7N3) and was depopulated to prevent spread of the disease.
- January 2009 – a low pathogenic avian flu was isolated in British Columbia (H5N2). All birds in the infected premise were humanely destroyed.
- November 2010 – a low pathogenic avian influenza (H5N2) was identified in Manitoba. All birds in the infected premise were humanely destroyed.
- December 2014 – a high pathogenic avian flu (H5N2) was identified in British Columbia.
- 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 of to prevent further spread of the virus.
- 2021 and 2022 – at the time of writing, investigations are ongoing into cases of highly pathogenic AI (H5N1) in farmed birds across Canada in most provinces.

### Causative Agent

Avian influenza (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.

---

<sup>3</sup> <https://inspection.canada.ca/animal-health/terrestrial-animals/diseases/reportable/avian-influenza/disease-incident/eng/1334851398063/1334851488454>

---

### **Symptoms**

The severity of symptoms and clinical outcome varies by the virus causing infection. Whether a virus is characterized as highly pathogenic (HPAI) or low pathogenic (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.

Infections in humans mainly manifest with respiratory symptoms ranging from conjunctivitis (i.e. red eyes with discharge) to influenza-like illness (i.e. fever, sore throat, muscle aches) to severe respiratory illness (e.g., pneumonia, acute respiratory distress, viral pneumonia). Nausea, diarrhea, vomiting and neurological signs may occur.

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.
- Death can occur in 48 hours and the mortality rate can approach 100%

### **Incubation Period**

The CDC reports that the estimated incubation period for human infection with AI viruses is generally 3 to 5 days but has been reported to be 7 to 10 days. For A(H5N1) virus infections in humans, current data indicate an incubation period averaging 2 to 5 days and ranging 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, 2015).

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

### **Reservoir/Source**

Avian influenza 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**

Human infections are primarily acquired through direct contact with infected birds or contaminated environments, including via:

- Direct transmission – viruses can be spread through direct contact with secretions or excretions from infected birds, including feces. There is no evidence that consumption of cooked eggs or poultry can transmit AI to humans.
- Indirect transmission – viruses can also be spread indirectly through contaminated items such as feed, water, equipment, clothing. Airborne spread may occur over limited distances.

In general, AI viruses are readily transmitted from farm-to-farm by the movement of live birds (domestic & 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.

### **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**

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. Refer to [Section 2-60 Influenza](#) for testing recommendations.

Animal specimens are submitted by the local veterinarian.

**Table 1. Avian Influenza Case Definition for Birds**

<b>Confirmed</b>	A bird with or without clinical illness with laboratory confirmation by PCR or isolation of the influenza type A virus and subtyping as H5 or H7
<b>Probable</b>	A bird with or without clinical illness with laboratory confirmation by PCR or isolation of the influenza type A virus

## Public Health Investigation

### I. Cases

Refer to [Section 2-60 Influenza](#) for investigation of novel influenza cases.

### II. Contacts/Contact Investigation

Identify individuals who may have been exposed or are at risk of being exposed to AI (e.g. farm family, farm workers, visitors). Table 2 identifies levels of risk for individuals exposed.

**Table 2. Categorizing contacts into their Risk Exposure Groups** (Public Health Agency of Canada, 2006) [https://www.phac-aspc.gc.ca/publicat/daio-enia/pdf/nat-ai-guide-2006\\_e.pdf](https://www.phac-aspc.gc.ca/publicat/daio-enia/pdf/nat-ai-guide-2006_e.pdf)

Level of Risk	Definition
<b>High exposure risk groups</b>	<ul style="list-style-type: none"> <li>Individuals with unprotected and very close exposure 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>Personnel involved in handling sick animals or decontaminating affected environments (including animal disposal) as part of outbreak control efforts (e.g., cullers)<sup>4</sup></li> </ul>
<b>Moderate exposure risk groups</b>	<ul style="list-style-type: none"> <li>Individuals who handle single or small groups of sick or dead animals infected with AI 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>

<sup>4</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

	<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 24 hours or more 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 1) in close contact (i.e., within 1 meter) 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>
<p><b>Low exposure risk groups</b></p>	<ul style="list-style-type: none"> <li>• Personnel involved in culling non-infected or likely non-infected animal populations as a control measure (e.g., those exclusively culling asymptomatic animals in a control area outside of the infected and restricted zones)</li> <li>• Individuals who handle (i.e., have direct contact with) asymptomatic animals that may be infected with AI based on species and possibly proximity to a geographic area where AI has recently been identified (e.g., bird banders)</li> <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 suspected or confirmed human AI cases and having no direct or indirect contact with infectious material from that case(s)</li> <li>• Laboratory personnel working with the influenza virus using appropriate laboratory procedures and infection control precautions</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 avian influenza;
- Human health risk based on the subtype;
- 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, along with sample information letters can be found at: [https://www.phac-aspc.gc.ca/publicat/daio-enia/pdf/nat-ai-guide-2006\\_e.pdf](https://www.phac-aspc.gc.ca/publicat/daio-enia/pdf/nat-ai-guide-2006_e.pdf) and <https://www.who.int/publications/i/item/who-guidance-on-public-health-measures-in-countries-experiencing-their-first-outbreaks-of-h5n1-avian-influenza>.

### **Communication**

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

### **Education**

- All individuals exposed should be provided information about avian influenza as well as information on prevention and control measures.
- Provide advice on minimizing further exposure.
- Those involved in the care, culling or cleaning up of infected birds or their environments should wear appropriate personal protective equipment and follow the biosecurity measures outlined by the Ministry of Agriculture or CFIA.
- Individuals, particularly producers whose flocks have been impacted, may require assistance in determining where to access mental health supports.

### 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 avian influenza virus or a contaminated environment, and report any symptom development immediately to public health (BCCDC, 2015);
  - Signs and symptoms may include fever (temperature of 100°F [37.8°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).
- Anyone that develops symptoms following exposure should be considered a suspect Novel Influenza case. See Testing below.
- 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.

### Testing

- Consult with MHO for recommendations.
- Individuals that develop signs and symptoms should be tested for influenza, isolated and managed as a suspect novel influenza case according to infection prevention and control measures. Refer to the [Section 2-60 – Influenza \(Attachment - Novel Influenza\)](#).

### Immunization

- Review immunization history for contacts.
- The current human influenza vaccines do not protect against AI; however, the seasonal influenza vaccine can potentially reduce the possibility of dual infection with avian and human influenza viruses. During periods of human influenza activity (i.e., “influenza season”), contacts who have not received the most recent seasonal influenza vaccine should be offered vaccine.
- Promote seasonal influenza vaccine for individuals involved in poultry industry or who may come in contact with migratory birds.

**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. (PHAC, 2006 [https://www.phac-aspc.gc.ca/publicat/daio-enia/pdf/nat-ai-guide-2006\\_e.pdf](https://www.phac-aspc.gc.ca/publicat/daio-enia/pdf/nat-ai-guide-2006_e.pdf)). Refer to **Table I-3** for the Antiviral Prophylaxis Risk Assessment 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.

**Table I-3. Antiviral prophylaxis Risk Assessment** (Public Health Agency of Canada, 2006)

		Exposure Risk		
		Low Risk Groups	Moderate risk groups	High risk groups
<b>Human illness risk<sup>5</sup></b>	<b>Subtype has previously been identified and is not known to have caused human illness</b>	No prophylaxis	No prophylaxis	No prophylaxis
	<b>Subtype is known to cause predominantly mild human illness</b>	No prophylaxis	Consider prophylaxis	Prophylaxis
	<b>Subtype is known to cause predominantly severe human illness</b>	No prophylaxis	Prophylaxis	Prophylaxis

**Antivirals for 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).

---

<sup>5</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.

- 
- 
- 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).
  - Refer to AMMI guidelines<sup>6</sup> or specific dosage recommendations by age group.

More information on CDC guidance for Follow-up of Close Contacts of Persons Infected with Novel Influenza A Viruses and Use of Antiviral Medications for Chemoprophylaxis.

#### **Antivirals for early treatment**

Refer to [Section 2-60 – Influenza](#) for recommendations and considerations for antiviral treatment.

### **III. 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. Refer to the Western College of Veterinary Medicine (WCVI) infection control manual for details.

#### **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.

---

<sup>6</sup> <https://jammi.utpjournals.press/doi/full/10.3138/jammi.2019.02.08>

- 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 provides 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 Medical Health Officer shall be notified.

#### **IV. Outbreak Measures**

The CFIA is the lead authority for monitoring, control and eradication of terrestrial diseases in Canada, including AI. The provincial Ministry of Agriculture 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 jointly lead the provincial response.

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;
- Where applicable, assess and advise on the public health risk associated with destruction, disposal and disinfection activities;
- Monitor human health impacts through ongoing surveillance activities (e.g., laboratory testing of suspect cases, syndromic respiratory surveillance systems, etc.)
- Provide guidance for local public health units and other health partners on response strategies, such as recommendations on occupational health and safety and infection prevention and control measures for health workers.

Refer to TADEs plan for details.

#### **V. Pandemic Measures**

See local, provincial, national pandemic plans

---

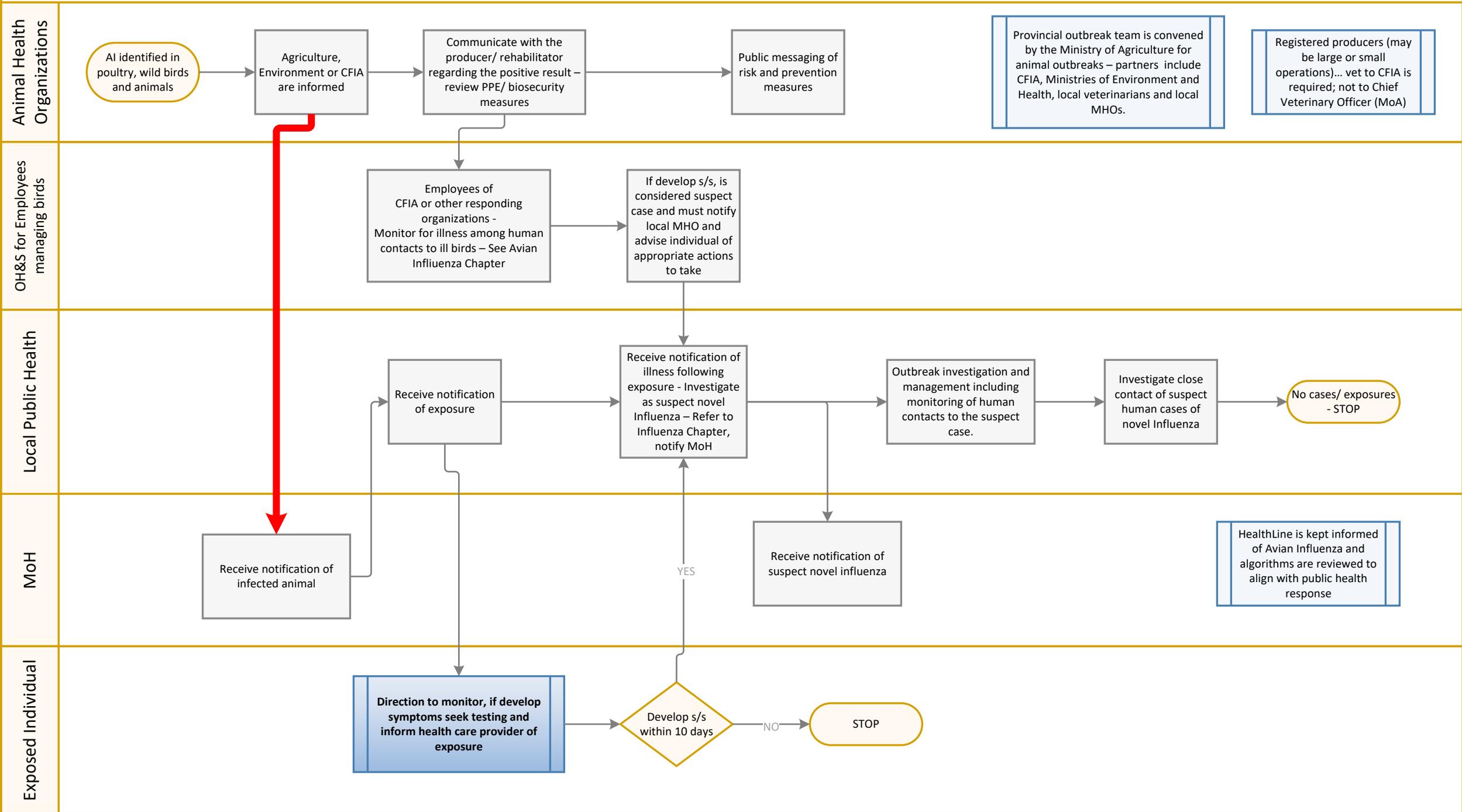
---

**Revisions**

Date	Change
May 2022	New

## References

- BCCDC (2015). Communicable Disease Control Reportable Zoonoses Guideline. Retrieved April 2022 from <http://www.bccdc.ca/Documents/CompleteReportableZoonosesGuidelineFinalVersions%20August%202019.pdf>
- Li, Y. T., Linster, M., Mendenhall, I. H., Su, Y., & Smith, G. (2019). Avian influenza viruses in humans: lessons from past outbreaks. *British medical bulletin*, 132(1), 81–95. <https://doi.org/10.1093/bmb/ldz036>
- Public Health Agency of Canada (2006). Human Health Issues related to Avian Influenza in Canada. Retrieved from [http://www.phac-aspc.gc.ca/publicat/daio-enia/pdf/nat-ai-guide-2006\\_e.pdf](http://www.phac-aspc.gc.ca/publicat/daio-enia/pdf/nat-ai-guide-2006_e.pdf)
- US Center for Disease Control and Prevention (March 24, 2022). Interim Guidance on Influenza Antiviral Chemoprophylaxis of Persons Exposed to Birds with Avian Influenza A Viruses Associated with Severe Human Disease or with the Potential to Cause Severe Human Disease. Retrieved April 6, 2022 from <https://www.cdc.gov/flu/avianflu/guidance-exposed-persons.htm>
- US Center for Disease Control and Prevention (2022). Past Examples of Possible Limited, Non-Sustained Person-to-Person Spread of Bird Flu. Retrieved May 2022 from <https://www.cdc.gov/flu/avianflu/h5n1-human-infections.htm>



### 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:	Address Phone email	<input type="checkbox"/> Household	<input type="checkbox"/> Immunocompromised  Meds:	<input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Daycare	<input type="checkbox"/> Symptoms (specify):  <input type="checkbox"/> None	<input type="checkbox"/> Treatment/Prophylaxis Advised specify:  <input type="checkbox"/> Not Advised				
Guardian/Coach:		<input type="checkbox"/> School/daycare								
# on team/in group _____	DOB Age HSN	<input type="checkbox"/> Other:  Date of last contact:	<input type="checkbox"/> Allergies:							
Occupation:	Address Phone email	<input type="checkbox"/> Household	<input type="checkbox"/> Immunocompromised  Meds:	<input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Daycare	<input type="checkbox"/> Symptoms (specify):  <input type="checkbox"/> None	<input type="checkbox"/> Treatment/Prophylaxis Advised specify:  <input type="checkbox"/> Not Advised				
Guardian/Coach:		<input type="checkbox"/> School/daycare								
# on team/in group _____	DOB Age HSN	<input type="checkbox"/> Other:  Date of last contact:	<input type="checkbox"/> Allergies:							
Occupation:	Address Phone email	<input type="checkbox"/> Household	<input type="checkbox"/> Immunocompromised  Meds:	<input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Daycare	<input type="checkbox"/> Symptoms (specify):  <input type="checkbox"/> None	<input type="checkbox"/> Treatment/Prophylaxis Advised specify:  <input type="checkbox"/> Not Advised				
Guardian/Coach:		<input type="checkbox"/> School/daycare								
# on team/in group _____	DOB Age HSN	<input type="checkbox"/> Other:  Date of last contact:	<input type="checkbox"/> Allergies:							
Occupation:	Address Phone email	<input type="checkbox"/> Household	<input type="checkbox"/> Immunocompromised  Meds:	<input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Daycare	<input type="checkbox"/> Symptoms (specify):  <input type="checkbox"/> None	<input type="checkbox"/> Treatment/Prophylaxis Advised specify:  <input type="checkbox"/> Not Advised				
Guardian/Coach:		<input type="checkbox"/> School/daycare								
# on team/in group _____	DOB Age HSN	<input type="checkbox"/> Other:  Date of last contact:	<input type="checkbox"/> Allergies:							