Ontario Public Health Standards: Requirements for Programs, Services and Accountability

Infectious Diseases Protocol

# Appendix 1: Case Definitions and DiseaseSpecific Information

Disease: Influenza

Effective: August 2024



# Influenza

□ Communicable

□ Virulent

Health Protection and Promotion Act (HPPA)<sup>1</sup>
Ontario Regulation (O. Reg.) 135/18 (Designation of Diseases)<sup>2</sup>

# **Provincial Reporting Requirements**

#### □ Confirmed case

As per Requirement #3 of the "Reporting of Infectious Diseases" section of the *Infectious Diseases Protocol, 2018* (or as current), the minimum data elements to be reported for each case are specified in the following:<sup>3</sup>

- O. Reg. 569 (Reports) under the HPPA,4
- The iPHIS User Guides published by Public Health Ontario (PHO); and
- Bulletins and directives issued by PHO.

Please note that confirmed or suspected cases of **novel**, **non-seasonal influenza** require immediate notification to the Ministry of Health (Ministry). The reporting of confirmed novel, non-seasonal influenza cases will be notified to the Public Health Agency of Canada (PHAC) and the World Health Organization under the International Health Regulations. Reporting of this disease is by phone and through the Ministry during business hours by calling 416-327-7392. After-hours and on weekends and holidays please call the Ministry's Health Care Provider Hotline at 1-866-212-2272.

# Type of Surveillance

Case-by-case

## **Case Definition**

#### **Confirmed Case**

Clinically compatible signs and symptoms with:

• Laboratory confirmation by detection or isolation of influenza virus from

appropriate clinical specimen(s) (e.g., nasopharyngeal/throat swabs)

#### OR

 An epidemiologic link to a laboratory-confirmed case (applies to institutional respiratory infection outbreaks only)

If laboratory results are suggestive of a novel, non-seasonal strain (e.g., positive for influenza A and negative for seasonal A(H1) and A(H3)\*) **OR** there is concern for novel, non-seasonal influenza; please see below for guidance and case definitions.

#### **Outbreak Case Definition**

The outbreak case definition varies with the outbreak under investigation. Please refer to the *Infectious Diseases Protocol, 2018* (or as current) for guidance in developing an outbreak case definition as needed.<sup>3</sup>

The outbreak case definitions are established to reflect the disease and circumstances of the outbreak under investigation. The outbreak case definitions should be developed for each individual outbreak based on its characteristics, reviewed during the course of the outbreak, and modified if necessary, to ensure that the majority of cases are captured by the definition. The outbreak definitions should be created in consideration of the case definitions.

Outbreak cases may be classified by levels of probability (i.e., confirmed and/or probable).

A single case of **novel**, **non-seasonal influenza** represents an outbreak.

## **Clinical Information**

## Clinical Evidence

Clinically compatible signs and symptoms defined as influenza-like illness (ILI) are characterized as having a temperature greater than 38 degrees Celsius and a cough, and one or more of the following: sore throat, arthralgia, myalgia, or prostration.

<sup>\*</sup> Specimens tested positive for influenza A with evidence of lower viral load (e.g., a high cycle threshold value) may fail subtyping/sequencing of the HA target regardless of the origin (i.e., seasonal versus novel). In these situations, contact PHO and the Ministry to support interpretating the test result and any subsequent necessary follow-up.

For novel, non-seasonal influenza, in addition to the signs and symptoms of ILI commonly seen with seasonal influenza, other clinically compatible symptoms include, rhinorrhea, fatigue, headache, conjunctivitis, shortness of breath or difficulty breathing, pneumonia, diarrhea, respiratory failure, acute respiratory distress syndrome, neurologic symptoms, or multi-organ failure. Severe acute respiratory illness (SARI) symptoms are fever (over 38 degrees Celsius), and new onset of (or exacerbation of chronic) cough or breathing difficulty and evidence of severe illness progression. The variation in spectrum of illness ranges from mild, atypical to severe.<sup>5</sup>

For both seasonal influenza and novel, non-seasonal influenza, in children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.<sup>5</sup>

### **Clinical Presentation**

Seasonal influenza is an acute respiratory infection (ARI). Symptoms include, but are not limited to, new or worsening cough, shortness of breath, fever, sore throat, headache, myalgia, and lethargy. Infections in children may also be associated with some gastrointestinal symptoms such as nausea, vomiting, and diarrhea, while the elderly may not mount a fever response and may present with an exacerbation of underlying conditions. In most people, illness resolves within five to seven days, however the very young and adults 65 and older are at highest risk of complications such as pneumonia, exacerbation of underlying conditions, encephalitis, sinusitis, myocarditis, and middle ear infections.<sup>6</sup> Many individuals infected with the influenza virus are asymptomatic.

Novel, non-seasonal influenza is an ARI and includes strains such as avian influenza and swine variant influenza. Symptoms include, but are not limited to, new or worsening cough, shortness of breath, fever, sore throat, headache, myalgia, and lethargy. Other signs and symptoms may include rhinorrhea, fatigue, headache, conjunctivitis, shortness of breath or difficulty breathing, pneumonia, diarrhea, respiratory failure, acute respiratory distress syndrome, neurologic symptoms, or multi-organ failure.<sup>5</sup>

# **Laboratory Evidence**

## **Laboratory Confirmation**

Any of the following will constitute a confirmed case of seasonal influenza:

- Positive influenza virus culture
- Positive for influenza virus antigen

- Significant (i.e., fourfold or greater) rise in influenza antibody titre between acute and convalescent sera
- Positive for influenza-specific RNA by nucleic acid amplification test (NAAT)

The following will constitute a confirmed case of novel, non-seasonal influenza:

Positive for novel, non-seasonal influenza by a molecular test

## **Approved/Validated Tests**

For seasonal influenza:

- Standard culture for influenza virus
- Influenza direct or indirect fluorescent antibody (DFA or IFA) antigen test
- Influenza serology tests (serology is not offered for clinical testing)
- NAAT for influenza virus RNA
- Rapid enzyme immunoassay (EIA)/immunochromatographic (ICT) antigen test kits

For novel, non-seasonal influenza:

 Novel, non-seasonal influenza molecular tests (e.g., molecular assays, molecular sequencing, whole genome sequencing)

#### **Indications and Limitations**

- NAAT primers and probes should be validated to detect the currently circulating strains of influenza
- A proportion of influenza isolates will be forwarded to the National Microbiology Laboratory by PHO to be strain typed and tested for antiviral resistance, as appropriate, for epidemiological, public health, and control purposes
- Rapid antigen testing is indicated only during the influenza season due to low positive predictive value
- Positive novel, non-seasonal influenza samples will be forwarded to the National Microbiology Laboratory by PHO for confirmation, as needed

The specimen of choice for seasonal influenza virus is the nasopharyngeal swab (NPS) taken within the first four days of illness.<sup>7</sup> When indicated and possible, lower respiratory tract specimens (e.g., bronchoalveolar lavage) should also be submitted, as these may have greater sensitivity than NPSs.

Symptomatic individuals under investigation for novel, non-seasonal influenza infection due to exposure to a confirmed novel influenza virus in an animal are candidates for laboratory testing by the Public Health Ontario Laboratory (PHOL). The health unit should contact PHOL's Customer Service Centre at 416-235-6556/1-877-604-4567 to arrange appropriate testing. Testing information for avian influenza is available on PHO's Avian Influenza RT-PCR webpage.<sup>8</sup>

Specimens for novel, non-seasonal influenza testing include nasopharyngeal or throat swabs, bronchial alveolar lavages, pleural fluid, and respiratory tract tissue. If there are symptoms of conjunctivitis, conjunctival specimens may also be collected if approved by a PHO microbiologist. Stool and blood may also be tested with prior approval from a PHO microbiologist.

For further information about human diagnostic testing, contact the <u>Public Health</u> <u>Ontario Laboratory services</u>.<sup>7</sup>

# **Case Management**

In addition to the requirements set out in the Requirement #2 of the "Management of Infectious Diseases – Sporadic Cases" and "Investigation and Management of Infectious Diseases Outbreaks" sections of the *Infectious Diseases Protocol, 2018* (or as current),<sup>3</sup> the board of health shall investigate cases to determine the source of infection. Refer to Provincial Reporting Requirements above for relevant data to be collected during case investigation.

Treatment is under the direction of the attending health care provider. Please see the <u>Association of Medical Microbiology and Infectious Disease Canada website</u> for the most recent guidelines for influenza antivirals.<sup>9</sup>

Advise the individual to stay home when ill and limit exposure to others, especially those at high risk for complications.

See below for Case Management for novel, non-seasonal cases.

# **Contact Management**

Not applicable for sporadic community cases.

See below for Contact Management for novel, non-seasonal cases.

# **Outbreak Management**

The most important control measure to prevent serious morbidity and mortality from seasonal influenza epidemics is annual immunization.

For outbreak management in institutions, refer to *Recommendations for <u>Outbreak Prevention and Control in Institutions and Congregate Living Settings, 2024* (or as current).<sup>10</sup></u>

# **Prevention and Control Measures**

#### **Personal Prevention Measures**

The best prevention measure is annual immunization.

Immunization is the most effective means to reduce the impact of influenza. All Ontario residents aged 6 months and older are eligible to receive a publicly funded influenza vaccine yearly. The National Advisory Committee on Immunization (NACI) statement on influenza is published annually and is available on the <a href="PHAC's website">PHAC's website</a>. 11

#### Other measures include:

- Travel Considerations: People at high risk of influenza complications embarking on travel to destinations where influenza is likely to be circulating should receive immunization.<sup>12</sup>
- General public education about the importance of hand hygiene, isolation when sick, masking, using proper respiratory etiquette, e.g., covering one's mouth and nose when coughing or sneezing and coughing and sneezing into the arm or using disposable tissues.

## **Infection Prevention and Control Strategies**

- Promotion of hand hygiene and respiratory etiquette.
- Healthy workplace strategies including: policies that support staff staying home when ill; and staff education about relevant policies.
- Droplet and contact precautions along with routine practices for cases in healthcare facilities.<sup>6</sup>
- Appropriate use of antivirals for prophylaxis and treatment, according to provincial guidelines.

Refer to <u>PHO's website</u> to search for the most up-to-date information on Infection Prevention and Control (IPAC).<sup>13</sup>

See below for prevention and control measures for novel, non-seasonal influenza.

## **Disease Characteristics**

**Aetiologic Agent -** Causative agents include three types of influenza virus: A, B, and C. Types A and B are of public health importance since both have been responsible for epidemics. Influenza A viruses are further divided into subtypes based on 2 viral surface glycoproteins: hemagglutinin (HA) and neuraminidase (NA). There are 18 different HA and 11 different NA sub-types. Frequent mutation of the genes encoding these surface glycoproteins results in the emergence of new strains. Influenza B viruses are comprised of two lineages, Victoria and Yamagata.<sup>6</sup>

Influenza strains have a typical naming convention, by type (A, B or C), geographic site of detection, laboratory number, year of isolation; for influenza A viruses, the HA and NA subtypes are also shown. Some examples include: A/New Caledonia/20/99(H1N1), A/Brisbane/10/2007(H3N2)-like virus, B/Malaysia/2506/2004.<sup>6</sup>

**Modes of Transmission -** Influenza virus particles are predominantly spread via infectious respiratory particles which are released or shed from infected persons when they sneeze, cough, or talk. These infectious respiratory particles may enter the host's eyes, nose or mouth or fall onto surfaces in the immediate environment. Some of these viruses may remain viable for extended periods of time, therefore contact transmission can occur by touching contaminated objects or surfaces and then touching one's face or eyes. 14,15

**Incubation Period** – Usually one to four days, with a mean of two days<sup>15</sup> but may be longer for non-seasonal, novel subtypes.

**Period of Communicability -** May become infectious 24 hours prior to onset of symptoms; viral shedding in nasal secretions usually peaks during the first three days of illness and ceases within seven days but can be prolonged in young children, the elderly, and those who are immunocompromised. <sup>15</sup> Period of communicability for novel, non-seasonal influenza subtypes may be longer.

**Reservoir -** Humans are the primary reservoir for human infection with seasonal influenza subtypes. Birds and mammalian reservoirs such as swine are likely sources of new human subtypes thought to emerge through genetic reassortment.<sup>6</sup>

**Host Susceptibility and Resistance -** Vaccine preventable; for seasonal influenza, a new vaccine is required annually because vaccine components included in the vaccine

are based on circulating strains from the previous season. Immunity is generally achieved within two weeks following immunization and lasts less than a year. Immunity to a strain of a specific subtype may provide significant immunity against a different strain of the same subtype.<sup>6</sup>

Please refer to <u>PHO's Ontario Respiratory Virus Tool</u> for the most up-to-date surveillance data and trends.<sup>16</sup>

Please refer to <u>PHO's Infectious Disease Trends in Ontario tool</u> for additional information on infectious disease trends in Ontario.<sup>17</sup>

For additional national and international epidemiological information, please refer to the Public Health Agency of Canada and the World Health Organization.

# Influenza - Novel, Non-Seasonal

#### **Confirmed Case**

A person with laboratory confirmation of a novel, non-seasonal influenza strain.

## **Suspected Case**

Individuals with laboratory-confirmed influenza suggestive of a novel, non-seasonal strain (e.g., positive for influenza A and negative for seasonal A(H1) and A(H3)<sup>†</sup>) **AND** who have **EITHER**:

Clinically compatible signs and symptoms;

#### OR

- Have had exposure in the previous 14 days<sup>‡</sup> via:
  - Direct or indirect, unprotected close contact to presumptive/confirmed animals infected with influenza; OR
  - Contact with or consumption of raw or under-cooked meat or related

<sup>&</sup>lt;sup>†</sup> Specimens tested positive for influenza A with evidence of lower viral load (e.g., a high cycle threshold value) may fail subtyping/sequencing of the HA target regardless of the origin (i.e., seasonal versus novel). In these situations, contact PHO and the Ministry to support interpretating the test result and any subsequent necessary follow-up.

<sup>&</sup>lt;sup>‡</sup> Exposure period may be shorter for some novel, non-seasonal subtypes with more established incubation periods, e.g., exposure period is 10 days for H5Nx subtypes.

uncooked animal products (e.g., raw eggs, unpasteurized (raw) milk or raw milk products) from presumptive/confirmed infected animals with influenza; **OR** 

- Unprotected exposure to biological material known to contain novel, non-seasonal influenza virus in a laboratory setting (e.g., primary clinical specimens, virus culture isolates); OR
- Direct or indirect, unprotected contact with contaminated environments such as surfaces contaminated with biological tissues from presumptive/confirmed infected animals with influenza (e.g., carcasses, feathers, feces, secretions, raw milk)

If influenza subtypes are pending and there is concern for novel, non-seasonal influenza, information should be gathered from the individual such that case and contact management can begin immediately if novel, non-seasonal subtyping is identified.

# **Case Management**

In addition to the requirements set out in the Requirement #2 of the "Management of Infectious Diseases – Sporadic Cases" and "Investigation and Management of Infectious Diseases Outbreaks" sections of the *Infectious Diseases Protocol, 2018* (or as current),<sup>3</sup> the board of health shall investigate cases to determine the source of infection as per the *Management of Avian Influenza or Novel Influenza in Birds or Animals Guideline, 2018* (or as current).<sup>18</sup>

All suspected and confirmed cases of novel, non-seasonal influenza require initiation of case and contact management by the board of health, immediate notification to the Ministry, and case consultation with PHO and the Ministry.

Individuals with known exposure to novel, non-seasonal influenza who develop any compatible symptoms should be evaluated by a health care provider. In advance of arriving at a health care provider's office or a health care facility, the symptomatic individual should notify the office or facility of their potential exposure to a novel, non-seasonal influenza virus.

While awaiting testing results, symptomatic individuals should be advised to self-isolate in their household (if they do not require hospital-level care), and not go to work or school.

Symptomatic individuals may be recommended to take antivirals as treatment, including empiric treatment while test results are pending. All confirmed cases should be recommended to take antivirals as treatment. Treatment with an appropriate antiviral

regimen, such as oseltamivir, is recommended, and treatment regimens should follow current clinical guidance, as well as consider any antiviral resistance patterns.

Boards of health shall regularly assess individuals with suspected or confirmed novel, non-seasonal influenza for the duration of their isolation and until they are deemed no longer infectious, including assessment of illness, need for isolation supports, and ensuring all close contacts exposed during the infectious period are identified. As human cases of novel, non-seasonal influenza are rare, duration of infectiousness of a case is not well established, and likely depends on severity of illness and underlying health status of the individual. Cases should remain in isolation until deemed no longer infectious.

Of note, mental health resources for farmers are available on the Ontario government website. 19 Free mental health counselling is available 24/7 to all farmers and farm families through the Farmer Wellness Initiative by calling 1-866-267-6255. 20 Those not eligible for this program can access local community health supports through Ontario 211 and ConnexOntario at 1-866-531-2600. In addition, Health811 is available 24 hours a day, 7 days a week by calling 811 to assist individuals experiencing a mental health crisis. Mental health programs identified within the board of health region that could support non-commercial farming operations should also be shared, as appropriate.

# **Contact Management**

Close contacts of suspected and confirmed novel, non-seasonal influenza should be identified. Close contacts include:

- Household contacts;
- Health care worker contacts without appropriate personal protective equipment (PPE); and
- Other close contacts with direct contact, face-to-face contact, or similar exposures.

Close contacts of suspected and confirmed cases should be actively monitored for 14 days§ from last exposure for any signs or symptoms (e.g., fever, cough, sore throat, wheezing, gastroenteritis, malaise, conjunctivitis, and other acute respiratory illness

<sup>§</sup> Duration of active monitoring may vary based on subtype and what is known about the incubation period for that sub-type; for example, 10 days of active surveillance may be used for H5Nx subtypes.

symptoms), tested if they develop any symptoms, and be offered antiviral prophylaxis. At a minimum, boards of health shall communicate with close contacts upon identification, at the end of their monitoring period, and at least once per week, or as directed by the Ministry. Asymptomatic testing of contacts may be considered on a case-by-case basis and must be discussed with PHOL and the Ministry.

Prophylaxis should be offered using an appropriate antiviral regimen after their last direct contact with the case, as per current clinical guidance (e.g., 75 mg of oseltamivir twice daily for 10 days for avian influenza, adjusted as needed for underlying health conditions, such as renal dysfunction).<sup>21</sup>

Close contacts who develop symptoms during the monitoring period are to self-isolate immediately and notify the health unit and seek medical care. In advance of arriving at a health care provider's office or a health care facility, the symptomatic individual should notify the office or facility of their potential exposure to a novel, non-seasonal influenza virus. Health care providers should follow infection prevention and control recommendations from the <a href="Best Practices for Prevention">Best Practices for Prevention</a>, Surveillance and Infection Control Management of Novel Respiratory Infections in All Health Care Settings. 22

## **Prevention and Control Measures**

#### **Personal Prevention Measures**

Individuals should avoid unprotected, indirect, or direct physical contact or close exposure to the following animals and materials potentially infected with novel influenza, including, but not limited to:

- Sick livestock, (e.g., commercial or domestic poultry) or other animals (e.g., wild birds)
- Carcasses of livestock or other animals
- Feces, feathers, or litter
- Raw milk or colostrum
- Surfaces and water that might be contaminated with animal excretions or secretions.

Close contact exposure may also include handling of animals for consumption or consuming uncooked or undercooked food or related uncooked food products, including unpasteurized (raw) milk.

Currently, there are no vaccines for novel, non-seasonal influenza approved for

humans. Close contacts should be recommended to receive a seasonal influenza vaccine, where possible. The recommendation for a seasonal influenza vaccine is to reduce the risk of co-infection and genetic re-assortment in a host. If an avian influenza vaccine becomes available, vaccine guidance will be provided regarding usage.

#### Other measures include:

 General public education about the importance of hand hygiene, isolation when sick, masking, using proper respiratory etiquette, e.g., covering one's mouth and nose when coughing or sneezing and coughing and sneezing into the arm or using disposable tissues.

## **Infection Prevention and Control Strategies**

- Promotion of hand hygiene and respiratory etiquette.
- Healthy workplace strategies including: policies that support staff staying home when ill; and staff education about relevant policies.
- Appropriate training and PPE to prevent and control disease transmission.<sup>23</sup>
- Airborne, droplet, and contact precautions along with routine practices for cases in healthcare facilities.<sup>22</sup>

Refer to PHO's website to search for the most up-to-date information on IPAC.<sup>13</sup>

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## **Case Definition Sources**

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Public Health Agency of Canada. Case definitions for communicable diseases under national surveillance [archived]. Can Commun Dis Rep. 2009;35 Suppl 2:1-123. Laboratory-confirmed influenza; p.36-7. Available from: <a href="https://www.canada.ca/content/dam/phac-aspc/migration/phac-aspc/publicat/ccdr-mtc/09pdf/35s2-eng.pdf">https://www.canada.ca/content/dam/phac-aspc/migration/phac-aspc/publicat/ccdr-mtc/09pdf/35s2-eng.pdf</a>

Public Health Agency of Canada. National case definitions: human infections with avian influenza A(H5N1) virus [Internet]. Ottawa, ON: Government of Canada; [2023] [modified 2023 Jul 31; cited 2024 Jun 20]. Available from:

https://www.canada.ca/en/public-health/services/diseases/avian-influenza-h5n1/health-professionals/national-case-definition.html

# **Document History**

Revision Date	Document Section	Description of Revisions
August 2024	Entire Document	General updates including references to reflect the most current guidance document. Addition of novel, non-seasonal influenza information throughout document, as well as in a new section.
April 2022	Entire Document	New template. Appendix A and B merged. No material content changes.
April 2022	Epidemiology: Occurrence section	Removed.
April 2022	ICD Codes	Removed.