

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

Infectious Disease Protocol

# **Appendix 1:**

## **Case Definitions and Disease-Specific Information**

### **Disease: Influenza**

Effective: May 2022

# Influenza

☒ Communicable

☐ Virulent

[Health Protection and Promotion Act \(HPPA\)](#)

[Ontario Regulation \(O. Reg.\) 135/18 \(Designation of Diseases\)](#)

## Provincial Reporting Requirements

☒ Confirmed case

☐ Probable 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:

- [O. Reg. 569](#) (Reports) under the HPPA;<sup>5</sup>
- The iPHIS User Guides published by Public Health Ontario (PHO); and
- Bulletins and directives issued by PHO.

Please note that cases of **novel influenza** require immediate notification to the Ministry of Health (ministry). The reporting of this event will be notified to 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**

- Demonstration of a significant (i.e., fourfold or greater) rise in antibody titres to influenza between acute and convalescent sera<sup>\*</sup>

**OR**

- An epidemiologic link to a laboratory-confirmed case<sup>†</sup>

**OR**

- Detection of influenza-specific ribonucleic acid (RNA)

## 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.

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 case definitions should

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<sup>\*</sup> Serology is not offered for clinical testing

<sup>†</sup> An epidemiologic link to a laboratory-confirmed case applies to institutional respiratory infection outbreaks only

be created in consideration of the outbreak definitions.

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

## Clinical Information

### Clinical Evidence

Clinically compatible signs and symptoms are defined as influenza-like illness (ILI) and are characterized as having a temperature > 38 degrees Celsius and cough and one or more of the following: sore throat, arthralgia, myalgia or prostration. In children under 5 years of age, gastrointestinal symptoms may also be present. In patients less than 5 years or > 65 years fever may not be prominent.

### Clinical Presentation

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 over 64 years are at highest risk of complications such as pneumonia, exacerbation of underlying conditions, encephalitis, sinusitis, myocarditis and middle ear infections.<sup>1</sup> Many individuals infected with the influenza virus are asymptomatic.

## Laboratory Evidence

### Laboratory Confirmation

Any of the following will constitute a confirmed case of 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)

## **Approved/Validated Tests**

- Standard culture for influenza virus
- Influenza direct or indirect fluorescent antibody (DFA or IFA) antigen test
- Influenza serology tests<sup>†</sup>
- NAAT for influenza virus RNA
- Rapid enzyme immunoassay (EIA)/immunochromatographic (ICT) antigen test kits

## **Indications and Limitations**

- NAAT primers and probes should be validated to detect the current strains of influenza
- A proportion of influenza isolates will be forwarded to the National Microbiology Laboratory by Public Health Ontario 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

The specimen of choice for seasonal influenza virus is the nasopharyngeal swab (NPS) taken within the first four days of illness.<sup>2</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.

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<sup>†</sup> Serology is not offered for clinical testing

For further information about human diagnostic testing, contact the [Public Health Ontario Laboratories](#).

## 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), 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 [Association of Medical Microbiology and Infectious Disease Canada website](#) for the most recent guidelines for influenza antivirals.

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

## Contact Management

Not applicable for sporadic community cases.

## Outbreak Management

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

For outbreak management in institutions refer to [Control of Respiratory Infection Outbreaks in Long-Term Care Homes](#) (2018, or as current).<sup>7</sup>

## 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 publicly funded influenza vaccine yearly. The National Advisory Committee on Immunization (NACI) statement on influenza is published annually and is available on the [PHAC's website](#).

For healthcare workers refer to the Ontario Hospital Association, OHA/OMA [Communicable Diseases Surveillance Protocols for Ontario Hospitals](#).

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>6</sup>
- General public education about the importance of hand hygiene, 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 work place 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>5</sup>
- Appropriate use of antivirals for prophylaxis and treatment, according to provincial guidelines.

Refer to [PHO's website](#) to search for the most up-to-date information on Infection Prevention and Control (IPAC).

## 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 (H) and neuraminidase (N). There are 18 different H and 11 different N 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>1</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 H and N 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>1</sup>

Since 1997 avian influenza infections have been identified in sporadic human cases and clusters of human infection with high fatality (e.g. H5N1 and H7N9). Transmission has gradually increased among poultry and poultry outbreaks of influenza A have occurred in several Asian countries, with the virus now endemic in poultry in some countries.<sup>1</sup>

**Modes of Transmission** - Influenza virus particles are predominantly spread via droplets which are released or shed from infected persons when they sneeze, cough, or talk. These large droplets do not stay suspended in the air and usually travel less than two metres (six feet). They 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.<sup>3,4</sup>

**Incubation Period** – Usually one to four days, with a mean of two days.<sup>4</sup>

**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>4</sup>

**Reservoir** - Humans are the primary reservoir for human infection. Birds and mammalian reservoirs such as swine are likely sources of new human subtypes thought to emerge through genetic reassortment.<sup>1</sup>



**Host Susceptibility and Resistance** - Vaccine preventable; new vaccine 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>1</sup>

Please refer to [PHO's Reportable Disease Trends in Ontario reporting tool](#) for the most up-to-date information on infectious disease trends in Ontario.

Please refer to [PHO's Ontario Respiratory Pathogen Bulletin](#) for surveillance data and trends.

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

## References

1. Heymann DL, editor. Control of Communicable Diseases Manual. 20 ed. Washington, D.C: American Public Health Association; 2015.
2. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Laboratory Services, 2022 [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; Available from: <https://www.publichealthontario.ca/en/Laboratory-Services/About-Laboratory-Services>
3. Ontario, Ministry of Health and Long-Term Care. Ontario Health Plan for an Influenza Pandemic 2013. Toronto, ON: Queen's Printer for Ontario; 2013. Available from: [http://www.health.gov.on.ca/en/pro/programs/emb/pan\\_flu/pan\\_flu\\_plan.aspx](http://www.health.gov.on.ca/en/pro/programs/emb/pan_flu/pan_flu_plan.aspx)
4. Committee on Infectious Diseases, American Academy of Pediatrics. Section 3: Summaries of Infectious Diseases: Influenza. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, editors. Red Book: 2018 Report of the Committee on Infectious Diseases. 31 ed. Itasca, IL: American Academy of Pediatrics; 2018.

5. Health Protection and Promotion Act, R.S.O. 1990, Reg. 569, Reports, (2018). Available from: <https://www.ontario.ca/laws/regulation/900569>
6. National Advisory Committee on Immunization, Public Health Agency of Canada. Canadian Immunization Guide Chapter on Influenza and Statement on Seasonal Influenza Vaccine for 2018–2019. Ottawa, ON: Her Majesty the Queen in Right of Canada; 2018. Available from: <https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-statement-seasonal-influenza-vaccine-2018-2019.html>
7. Ontario, Ministry of Health and Long-Term Care. Control of Respiratory Infection Outbreaks in Long-Term Care Homes. Toronto, ON: Queen's Printer for Ontario; 2018. Available from: [http://www.health.gov.on.ca/en/pro/programs/publichealth/oph\\_standards/reference.aspx](http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/reference.aspx)

## Case Definition Sources

Ontario Agency for Health Protection and Promotion (Public Health Ontario), Provincial Infectious Diseases Advisory Committee. Annex B: Best Practices for Prevention of Transmission of Acute Respiratory Infection. Annexed to: Routine Practices and Additional Precautions in All Health Care Settings. Toronto, ON: Queen's Printer for Ontario; 2013. Available from: [https://www.publichealthontario.ca/-/media/Documents/B/2012/bp-prevention-transmission-ari.pdf?sc\\_lang=en](https://www.publichealthontario.ca/-/media/Documents/B/2012/bp-prevention-transmission-ari.pdf?sc_lang=en)

Public Health Agency of Canada. Laboratory-Confirmed Influenza. In: Case Definitions for Communicable Diseases under National Surveillance. Canada Communicable Disease Report. 2009;35S2.

## Document History

Revision Date	Document Section	Description of Revisions
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.