

Appendix A: Disease-Specific Chapters

Chapter: Influenza

Effective: February, 2019

Influenza

Communicable

Virulent

**Health Protection and Promotion Act:
O. Reg. 135/18 (Designation of Diseases)**

1.0 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.¹

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/2506/2004.¹

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.¹

2.0 Case Definition

2.1 Surveillance Case Definition

Refer to [Appendix B](#) for Case Definitions.

2.2 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 be created in consideration of the outbreak definitions.

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

3.0 Identification

3.1 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.¹ Many individuals infected with the influenza virus are asymptomatic.

3.2 Diagnosis

The specimen of choice for seasonal influenza virus is the nasopharyngeal swab (NPS) taken within the first four days of illness.^{2,3} When indicated and possible, lower respiratory tract specimens (e.g. bronchoalveolar lavage) should also be submitted, as these may have greater sensitivity than NPSs.

See [Appendix B](#) for diagnostic criteria relevant to the Case Definitions.

For further information about human diagnostic testing, contact the Public Health Ontario Laboratories or refer to the Public Health Ontario Laboratory Services webpage: <http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/default.aspx>

4.0 Epidemiology

4.1 Occurrence

Worldwide; as sporadic cases, epidemics occur almost annually and pandemics rarely.¹ During a typical influenza season in Ontario, peak influenza activity can occur anywhere from December to March.

Please refer to Public Health Ontario's (PHO) Reportable Disease Trends in Ontario reporting tool and The Ontario Respiratory Pathogen Bulletin other reports for the most up-to-date information on infectious disease trends in Ontario.

<http://www.publichealthontario.ca/en/DataAndAnalytics/Pages/DataReports.aspx>

<http://www.publichealthontario.ca/en/ServicesAndTools/SurveillanceServices/Pages/Ontario-Respiratory-Virus-Bulletin.aspx>

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

4.2 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.¹

4.3 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.^{4,5}

4.4 Incubation Period

Usually one to four days, with a mean of two days.⁵

4.5 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.⁵

4.6 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.¹

5.0 Reporting Requirements

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:

- *Ontario Regulation 569* (Reports) under the *Health Protection and Promotion Act* (HPPA);⁶
- The iPHIS User Guides published by PHO; and
- Bulletins and directives issued by PHO.

Please note that cases of **novel influenza** require immediate notification to the Ministry of Health and Long-Term Care (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.

6.0 Prevention and Control Measures

6.1 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:

<https://www.canada.ca/en/public-health/services/immunization/national-advisory-committee-on-immunization-naci.html>

For healthcare workers refer to the Ontario Hospital Association, OHA/OMA Communicable Diseases Surveillance Protocols for Ontario Hospitals:

<https://www.oha.com/labour-relations-and-human-resources/health-and-safety/communicable-diseases-surveillance-protocols>

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.⁷
- 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.

6.2 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.⁵
- Appropriate use of antivirals for prophylaxis and treatment, according to provincial guidelines.

Refer to PHO's website at www.publichealthontario.ca to search for the most up-to-date Provincial Infectious Diseases Advisory Committee (PIDAC) information on Infection Prevention and Control.

6.3 Management of Cases

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 Section 5: 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.

<https://www.ammi.ca/?ID=122&Language=ENG>

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

6.4 Management of Contacts

Not applicable for sporadic community cases.

6.5 Management of Outbreaks

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 Recommendations for the Control of Respiratory Infection Outbreaks in Long-Term Care Homes (2018, or as current).⁸

7.0 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). Labstract – June 2018: Respiratory Viral Testing Algorithm [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2018 [updated June 19, 2018; cited August 7, 2018]. Available from: <https://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Labstracts.aspx>
3. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Virus Respiratory Kit order#: 390082 [Internet]. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2018 [cited August 7, 2018]. Available from: <https://www.publichealthontario.ca/en/laboratory-services/kit-test-ordering-instructions/virus-respiratory-kit>
4. 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
5. 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.

6. Health Protection and Promotion Act, R.S.O. 1990, Reg. 569, Reports, (2018). Available from: <https://www.ontario.ca/laws/regulation/900569>
7. 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>
8. Ontario, Ministry of Health and Long-Term Care. Recommendations for the 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

8.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
December 2014	General	New template. Title of Section 4.6 changed from “Susceptibility and Resistance” to “Host Susceptibility and Resistance” Title of Section 5.2 changed from “To Public Health Division (PHD)” to “To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry”. Section 9.0 Document History added.
December 2014	1.0 Aetiologic Agent	Entire section revised.
December 2014	2.2 Outbreak Case Definition	Entire section removed.

Revision Date	Document Section	Description of Revisions
December 2014	3.1 Clinical Presentation	<p>Addition of "(ARI)".</p> <p>"Symptoms include sudden onset of high fever, headache, myalgia, lethargy, coryza, sore throat and non-productive cough" changed to "Symptoms include, but not limited to, new or worsening cough, shortness of breath, fever, sore throat, headache, myalgia, and lethargy."</p> <p>Addition of "while the elderly may not mount a fever response".</p> <p>"Most people resolve within 2-7 days, however the very young and old could develop complications such as..." changed to "In most people, illness resolves within five to seven days, however the very young and old could develop complications such as..."</p>
December 2014	3.2 Diagnosis	<p>Addition of "When indicated and possible, lower respiratory tract specimens (e.g. bronchoalveolar lavage) should also be submitted, as these may have greater sensitivity than NPSs."</p> <p>Addition of "For further information about human diagnostic testing, contact the Public Health Ontario..."</p>

Revision Date	Document Section	Description of Revisions
December 2014	4.1 Occurrence	<p>Addition of “During a typical influenza season in Ontario, peak influenza activity can occur anywhere from December to March.”</p> <p>“The Ontario Influenza Bulletin provides information on influenza activity in Ontario it is produced...” changed to “The Ontario Respiratory Virus Bulletin and the Laboratory Based Respiratory Pathogen Surveillance Report ...”</p> <p>Addition of two links: http://www.publichealthontario.ca/en/ServicesAndTools/SurveillanceServices/Pages/Ontario-Respiratory-Virus-Bulletin.aspx http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/PHO-Laboratories-surveillance-updates.aspx</p>
December 2014	4.2 Reservoir	Removal of “as well as possibly horses.”
December 2014	4.3 Modes of Transmission	Entire section revised.
December 2014	4.4 Incubation Period	“Usually 1-3 days.” Changed to “Usually one to four days.”
December 2014	4.5 Period of Communicability	Addition of “the elderly and those who are immunocompromised.”
December 2014	4.6 Host Susceptibility and Resistance	“...the components of which depend on circulating strains” changed to “because vaccine components included in the vaccine are based on circulating strains from the previous season.”
December 2014	5.1 To Local Board of Health	Entire section revised.
December 2014	5.2 To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry	Entire section revised.

Revision Date	Document Section	Description of Revisions
December 2014	6.1 Personal Prevention Measures	Addition of “and nose”.
December 2014	6.2 Infection Prevention and Control Strategies	Entire section revised.
December 2014	6.3 Management of cases	Removal of “Refer to Ontario Regulation 569 under the HPPA for relevant data to collect and where possible...” Addition of “Please see the Association of Medical Microbiology and Infectious Disease Canada website for the most recent...”
December 2014	6.5 Management of Outbreaks	Addition of “(or as current)”.
December 2014	7.0 References	Updated.
December 2014	8.0 Additional Resources	Updated.
February 2019	General	Minor revisions were made to support the regulation change to Diseases of Public Health Significance. Common text included in all Disease Specific chapters: Surveillance Case Definition, Outbreak Case Definition, Diagnosis, Reporting Requirements, Management of Cases, and Management of Outbreaks. The epidemiology section and references were updated and Section 8.0 Additional Resources was deleted.
February 2019	1.0 Aetiologic Agent	Minor revisions to entire section.
February 2019	3.1 Clinical Presentation	Minor revisions to entire section.
February 2019	4.4 Incubation Period	Added: Mean of two days.
February 2019	5.0 Reporting Requirements	Second paragraph added: “Please note that cases of novel influenza requires immediate notification of the Ministry...”

