INFLUENZA

Case definition

Nova Scotia's confirmed case definition for influenza, clinical evidence of ILI for surveillance purposes, and reporting requirements are found at: ***https://novascotia.ca/dhw/populationhealth/surveillanceguidelines/influenza.pdf***

Causative agent

Influenza viruses belong to the family Orthomyxoviridae and are classified into three distinct types on the basis of major antigenic differences: influenza A, B, and C. Influenza A and B are routinely associated with regional and widespread epidemics whereas influenza C is more commonly responsible for sporadic cases, mild illness and minor localized outbreaks.

Influenza A is further categorized into subtypes based on the presence of two surface antigens: hemagglutinin (H) and neuraminidase (N). Hemagglutinin is required for the initial attachment to cells to start infection. Neuraminidase plays a role in facilitating the virus reaching the cell surface by disrupting mucus and the release of progeny virus from infected cells. Although there are 18 different types of HA and 11 types of NA, only limited subtypes have infected humans. Currently H3N2 and H1N1 strains routinely cocirculate in humans. Influenza A viruses are known to cause more severe illness and have been the only influenza virus to cause pandemics.

Influenza A viruses undergo reassortment of their viral segments resulting in new HA and/or new HA and NA proteins. This is known as antigenic shift and can lead to emergence of novel influenza A viruses. When human to human transmission occurs with limited population immunity, pandemics can be initiated.

Influenza B is more stable with less antigenic drift (small antigen changes of influenza viruses) compared to Influenza A. There are two main Influenza B lineages-Victoria and Yamagata. Although these two lineages have co-circulated in the past, B Yamagata has not been confirmed since March 2020.

Ongoing genetic drift contributes to repeated epidemics of seasonal influenza and the susceptibility of individuals to multiple influenza virus infections during their lifetime.

Source

Humans are the primary reservoir for human infections. Birds and other mammals such as swine may serve as potential sources of emerging subtypes capable of infecting humans thought to emerge through genetic reassortment or antigenic shift.

Incubation

The incubation period for influenza ranges from one to four days. On average, symptoms appear within two days of exposure to the virus.

Transmission

Primary transmission occurs directly human to human through large droplets from a cough or sneeze of an infected person propelled through the air (generally up to two meters) and deposited on the mouth, nose or eyes of people nearby. Influenza virus can also be spread through indirect transmission via contaminated objects or surfaces. Influenza virus may persist for two to eight hours on solid surfaces, particularly on hard, impermeable surfaces and in lower temperatures and lower humidity.

Communicability

Adults can shed influenza virus one day before symptoms begin through five to ten days after illness onset and may continue after symptom resolution. However, communicability is greatest in the first three to five days. Young children and immunocompromised adults can shed virus up to ten or more days after onset of symptoms.

Symptoms

The spectrum of clinical features of seasonal influenza ranges from no symptoms to severe complicated illness and death. Typically, symptoms present as an acute onset of fever (more likely in children), cough (usually dry), and myalgia. Headache, chills, prostration, rhinitis, and sore throat may also be present. Cough is often severe and can last two or more weeks; fever and other symptoms generally resolve in five to seven days. Nausea, vomiting, and diarrhea may accompany respiratory symptoms in up to one-third of cases in both adults and children. Influenza may not present typically in elderly and instead exacerbate underlying conditions such as heart failure. Infants may present with sepsis-like symptoms.

Yearly seasonal influenza epidemics impose a substantial health burden on all age groups, however, the highest risk of complications occur among the following groups: children 6-59 months; adults older than 65 years; pregnant women; and persons of any age with certain chronic medical conditions, including neurological, cardiovascular, pulmonary, renal, hepatic, hematological, immunological, and metabolic disorders, those in nursing homes or other chronic care facilities. There is also high risk of complications and/hospitalization among Indigenous peoples due to intersection of factors (e.g. chronic health conditions, reduced access to health care, and other social and environmental factors).

Diagnostic testing

Currently the most sensitive and specific test for the rapid detection of influenza viruses is the nucleic acid amplification test (NAAT) (e.g. reverse transcription polymerase chain reaction (RT-PCR) or transcription mediated amplification (TMA)) for the detection of virus-specific ribonucleic acid (RNA) sequences from throat/nasal, and nasopharyngeal (NP) secretions, tracheal aspirates, or bronchoalveolar lavage fluid. NP swabs are preferred sample type. The current NAAT in use includes a multiplex test that detects Influenza A, B and SARS-CoV2. This NAAT may be used for specimens collected in acute care settings, long-term care facilities, as well as community.

For more detailed information regarding on influenza A subtyping and surveillance see Nova Scotia Government's ***Respiratory Response Plan Appendix D: Laboratory Procedures***.

Treatment and Chemoprophylaxis

Most individuals with influenza do not require treatment beyond supportive measures. Influenza vaccination provides protection against severe illness and hospitalization. In Canada, two neuraminidase inhibitors (oseltamivir and zanamivir) are licensed for use as treatment and pre-exposure prophylaxis against influenza. Each year, the National Microbiology Laboratory (NML) monitors the susceptibility of circulating strains of influenza to these antivirals and over the past few years the predominant circulating strains have been sensitive to oseltamivir and zanamivir, but it is important to be aware of the potential for antiviral resistance to occur.

Treatment is under the direction of the attending health care provider and is beyond the scope of public health. Briefly, early administration of antivirals can reduce severe complications and death and are most beneficial when started within 48 hours of developing symptoms. Antiviral treatment should still be considered after 48 hours for those with or at risk of progressive, severe, or complicated illness or if the individual belongs to a group at risk for severe disease. Initiation of antiviral treatment should not wait for laboratory confirmation.

The use of antivirals for chemoprophylaxis is typically reserved for controlling outbreaks among residents and staff of long-term care facilities and other residential institutions. For further instructions regarding the use of antivirals in outbreak settings, please refer to the ***Guide to Respiratory Virus Infection and Outbreak Management in Long-Term Care Facilities***.

For further information on the use of antiviral treatment, please refer to the ***Association of Medical Microbiology and Infectious Disease Canada*** influenza resources:

- ***Use of antiviral drugs for seasonal influenza: Foundation document for practitioners—Update 2019***
- ***2021–2022 AMMI Canada guidance on the use of antiviral drugs for influenza in the COVID-19 pandemic setting in Canada***

PUBLIC HEALTH MANAGEMENT & CONTROL

Long term care facilities:

- For cases, contacts or outbreaks identified in long term care facilities, please refer to the ***Guide to Prevention of Respiratory Virus Infection and Outbreak Management for Long-Term Care Facilities***.

Acute care settings:

- Case and contact management within acute care settings for inpatients is overseen internally by Infection Prevention and Control (IPAC) and employee case and contact management is directed by Occupational Health Safety and Wellness (OHSW).
- Public Health follow up is limited to reporting outcomes of laboratory confirmed cases weekly until discharge or death for a maximum of 4 weeks. Liaise with hospital staff for follow-up as needed. Outcomes should be entered into Panorama. Refer to DHW Surveillance Guidelines for further information.
- Organizational IPAC and OHSW policies should be followed for case and contact **exclusions**.

Community:

- Public Health identification and follow-up of cases and contacts in community settings is **not** required.
- If contacted by a community member or setting, Public Health may provide education about influenza, ILI and prevention measures, including seasonal vaccines found on ***Protect Yourself and Others from Influenza*** website. General resources and fact sheets for preventing spread of respiratory pathogens are available at ***https://novascotia.ca/coronavirus/resources/.*** For congregate living settings, refer and provide link to Nova Scotia ***Guidance for Respiratory Viruses in Congregate Living Settings***.
- Public Health may provide additional support and/or outbreak management advice as indicated. Consult with MOH when needed to determine further

public health follow-up in the event of an outbreak (e.g., community-based control strategies such as closure of schools/gatherings). Refer to the ***Outbreak Response Plan***.

- In community settings, **no exclusions** are required. Individuals are encouraged to stay home when experiencing symptoms indictive of influenza, ILI or other respiratory pathogens and follow any applicable organizational occupational health policies and procedures.

Immunization

The most effective way to prevent influenza is through immunization (immunoprophylaxis). Evidence continues to show seasonal influenza vaccines are effective at protecting against illness, hospitalization, and death. In Nova Scotia, influenza vaccine is offered and recommended in the fall prior to the start of respiratory season. This is particularly important for people at increased risk of infection or severe disease, as well as for those capable of transmitting the virus to people at increased risk. As of 2023, those 65 years and older are eligible to receive high dose influenza vaccine which has four times the amount of antigen and offers better protection for this age group.

The World Health Organization's (WHO) provides recommendations for the strains selected for inclusion in each respiratory season's vaccine based on characteristics of circulating influenza virus strains.

For further details regarding Nova Scotia's influenza immunization program see:
Publicly Funded Seasonal Inactivated Influenza Vaccine Information for Health Care Providers

Publicly Funded Vaccine/Immunoglobulin Eligibility Policy

Publicly Funded Vaccine Eligibility for Individuals at High Risk of Acquiring Vaccine Preventable Diseases

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