

# Nova Scotia Health System Pandemic Influenza Plan

## **Chapter 3: Surveillance**

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## Background

Surveillance has been defined as the ongoing, systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know (U.S. Centers for Disease Control 1988). In Canada, surveillance of communicable diseases is supported by provincial legislation that mandates the reporting or notifying of diseases by laboratories and physicians. The list of such diseases differs by province/territory; therefore, in order to facilitate comparability across jurisdictions, national disease-specific case definitions have been developed that provide standardized criteria for reporting those diseases nationally to the Centre for Infectious Disease Prevention and Control, Public Health Agency of Canada, (Health Canada 2000).

Monitoring influenza is an ongoing activity in Nova Scotia. The existing system will be enhanced for use during a pandemic. During a pandemic, surveillance data will be used to track the spread and impact of the disease, to monitor the effectiveness of control programs, and to determine response activities. The surveillance system will have multiple components, and many different groups will be responsible for surveillance activities, including primary care practitioners, hospitals, long-term care facilities, schools, laboratories, and public health.

As the pandemic progresses, the ability to collect and analyse data and the type of data that will be useful will change. Early in the pandemic, it will be important to identify the arrival of the pandemic strain in Nova Scotia and to track its movement through the population. Once influenza becomes widespread, the actual number of cases will become less important and measures of morbidity, mortality, societal disruption, and health resources capacity will be monitored.

## Objectives

The objectives of pandemic influenza surveillance are

1. to permit early detection of the strain of influenza associated with the pandemic
2. to collect data that will provide the information necessary to trigger activities outlined in the Nova Scotia Health System Pandemic Influenza Plan
3. to monitor when and where the influenza strain is circulating in Nova Scotia
4. to describe the ill population

5. to collect data that will assist in identifying groups at high risk of acquiring influenza and of developing complications
6. to estimate the impact of influenza (e.g., hospitalizations, case fatality rate, absenteeism)
7. to evaluate the effectiveness of control strategies
8. to effectively communicate surveillance information to the appropriate stakeholders

## Planning Assumptions

- Surveillance needs will change as the pandemic progresses. During the pandemic alert period, detailed reporting of epidemiologic data will be possible and necessary. As influenza activity becomes widespread, resources available for surveillance will be limited. This will impact routine surveillance activities, such as sentinel reporting of influenza-like illness (ILI), so that the data may not be representative or reliable.
- There are many partners in surveillance.
- Surveillance data may be used to trigger other activities.

## Influenza Surveillance

The pandemic influenza surveillance system will be built on the existing system used for surveillance of seasonal influenza and other respiratory viruses, such as parainfluenza, adenovirus, and respiratory syncytial virus (RSV). The components of the current influenza surveillance system (notifiable diseases, FluWatch, and severe respiratory illness surveillance) are described below.

### Notifiable Diseases

Both influenza of pandemic potential and laboratory-confirmed influenza are notifiable diseases in Nova Scotia under the Health Protection Act.

## FluWatch

FluWatch is a national influenza surveillance program, administered by the Public Health Agency of Canada. Data are collected on several key indicators of influenza activity including

- rate of influenza-like illness (ILI) activity in the general population
- number of laboratory-confirmed influenza cases
- number of influenza outbreaks in long-term care facilities and hospitals
- number of schools/workplaces with greater than 10 per cent (>10%) absenteeism due to ILI

A network of sentinel physicians report ILI activity in the general population directly to FluWatch. The number of laboratory-confirmed cases, outbreaks, and schools/workplaces with >10% absenteeism are obtained by district Public Health Services and used to determine the overall level of influenza activity in each region of the province. These data are compiled provincially and reported to FluWatch weekly.

The FluWatch program produces a summary report of influenza activity in Canada that is published on a weekly basis during the influenza season (October to April) and biweekly during the off-season (May to September). This report is available on the FluWatch website and is updated every Friday ([www.phac-aspc.gc.ca/fluwatch/](http://www.phac-aspc.gc.ca/fluwatch/)). For definitions of terms used in FluWatch, please see Annex A in this chapter.

### **Rate of Influenza-Like Illness Activity in the General Population (Sentinel Physician Surveillance)**

Influenza-like illness (ILI) is defined as the acute onset of respiratory illness with fever and cough and with one or more of the following: sore throat, arthralgia, myalgia, or prostration that could be due to influenza virus. In children under 5 years, gastrointestinal symptoms may also be present. In patients under 5 years of age or 65 years and older, fever may not be prominent.

Sentinel physicians report the extent of ILI activity in the general population across the province directly to the FluWatch program office in Ottawa. Once a week, on a specified day, each sentinel physician reports the number of patient visits that were due to ILI and the total number of patients seen, by age group. The FluWatch program compiles the information from each sentinel physician and calculates an overall rate of ILI activity for the province (i.e., number of patient visits due to ILI per 1000 patient visits).

The recruitment of sentinel physicians for participation in the national influenza surveillance program is the responsibility of the College of Family Physicians of Canada.

Prior to the beginning of the influenza season, the college canvasses family physicians in each province and territory with the goal of having at least one sentinel physician for each census subdivision. As participation in this sentinel surveillance program is voluntary, the list of sentinel physicians may change from year to year and is kept confidential.

### **Number of Laboratory-Confirmed Cases**

Clinical specimens collected by sentinel and non-sentinel physicians, long-term care facilities, emergency departments, and public health nurses are submitted to the virology laboratory at the QEII Health Sciences Centre in Halifax for testing (see Annex 3-B). Positive results are downloaded by the QEII laboratory into the Electronic Laboratory Reporting (ELR) database and are accessible by selected communicable disease staff in the district health authorities (DHAs) and the Department of Health Promotion and Protection. On a weekly basis, the QEII laboratory also forwards the aggregate number of specimens tested and the number (%) positive for influenza, parainfluenza, adenovirus, and RSV directly to the FluWatch program office in Ottawa.

In addition, a subset (10 per cent to 15 per cent) of all of the positive specimens is sent to the National Microbiology Laboratory (NML) in Winnipeg for antigenic strain characterization. Typically, a few specimens from both the beginning and the end of the influenza season are also sent to the NML for sub-typing. This information is used to determine the influenza strain(s) in circulation for a given season.

### **Number of Influenza Outbreaks in Long-Term Care Facilities and Hospitals**

Outbreaks are reported by the facility (e.g., school, daycare, acute or long-term care institution) to district Public Health Services, which then designates a public health nurse to investigate. When an outbreak is suspected, the reporting district health authority faxes an initial outbreak investigation report to the Department of Health Promotion and Protection; this is followed up with a final report when the outbreak is declared over.

### **Influenza Activity Reporting**

The level of influenza activity is determined by the presence of ILI in the community, the identification of lab-confirmed cases, and the number of facilities reporting outbreaks (i.e., either lab-confirmed or >10% absenteeism, depending on the type of facility). Based on these indicators, an activity level (no activity, sporadic, localized, or widespread) is assigned to each of the province's nine district health authorities.

## Severe Respiratory Illness Surveillance

Following the emergence of severe acute respiratory syndrome (SARS) and outbreaks of avian influenza affecting humans, the World Health Organization and the Public Health Agency of Canada recommended increased vigilance for the surveillance of severe respiratory illnesses (SRI).

Enhanced SRI surveillance ensures rapid recognition and appropriate management of emerging respiratory infections. Surveillance efforts are focused on specific clinical syndromes (e.g., pneumonia or respiratory distress syndrome) in hospitalized patients who may have been exposed to these viruses during international travel.

In order to assist local health care professionals with SRI surveillance, the Nova Scotia Department of Health Promotion and Protection publishes a list of the current “areas of concern.” Areas of concern are defined as “countries or regions with ongoing transmission of avian influenza (H5N1) in humans and/or poultry OR countries or regions where the potential emergence/re-emergence of SARS is likely to occur.” The list is updated as required based on the most current information from the World Health Organization. The Department of Health Promotion and Protection distributes this list to physicians, infection control practitioners, emergency health services, regional communicable disease nurse managers, and hospital CEOs on a weekly basis ([www.gov.ns.ca/hpp/ocmoh/sri.htm](http://www.gov.ns.ca/hpp/ocmoh/sri.htm)).

## Communication

The Department of Health Promotion and Protection produces a weekly report called *Respiratory Watch*, which summarizes respiratory virus activity in the province. This report includes detailed information on the level of influenza activity (sentinel ILI rates, number of lab-confirmed cases, and number of outbreaks collected through the FluWatch program) for each of the nine reporting regions (DHAs) in Nova Scotia. It also includes a summary of the lab-based surveillance system for RSV as, well as lab-confirmed cases of parainfluenza virus and adenovirus.

This weekly report is distributed via e-mail to staff in the Department of Health Promotion and Protection, regional communicable disease managers, medical officers of health, Health Promotion and Protection Communications, and the Director of Long-Term Care, as well as selected infectious disease physicians, microbiologists, and infection control practitioners. Other individuals can be added to this mailing list on request. The weekly *Respiratory Watch* is posted on the department’s website, where it is accessible to the public ([www.gov.ns.ca/hpp/ocmoh/flu.htm](http://www.gov.ns.ca/hpp/ocmoh/flu.htm)).

Public health alerts concerning influenza or avian influenza are posted on the password-protected Canadian Integrated Outbreak Surveillance Centre (CIOSC) website. When an alert is posted, an e-mail notification is sent to all individuals on the CIOSC distribution list. This list is routinely updated, and new names may be added upon request to the Department of Health Promotion and Protection.

## Roles and Responsibilities

### World Health Organization

- Provide global guidance regarding the pandemic to the Public Health Agency of Canada

### Federal

- Gather global data and disseminate the information to the provinces and territories
- Provide national coordination of the FluWatch program
- Maintain communication tools such as CIOSC, which can be used for alerts and for routine FluWatch
- Maintain an up-to-date surveillance strategy in the Canadian Pandemic Influenza Plan (Public Health Agency of Canada)

### Provincial

- Establish and maintain a provincial influenza surveillance system
- Annually review, evaluate, update, and report on the Nova Scotia influenza surveillance system:
  - Disease surveillance
    - Ensure that there is at least one sentinel physician per DHA
  - Laboratory surveillance
    - Determine, in consultation with the public health laboratory program, the appropriate tests required to support surveillance activities and to assist in management of the public health response

### Communications

- Ensure that global, national, and provincial influenza surveillance information is gathered and disseminated to decision makers and to the public
- Ensure that communication tools such as CIOSC are made available to appropriate stakeholders
- Develop a business continuity plan for surveillance, including cross-training of staff for respiratory virus surveillance activities

### Districts

- Continue to participate in influenza surveillance according to the provincial influenza surveillance plan
- Maintain a designated contact person for sentinel physicians  
Monitor absenteeism in selected workplaces
- Develop a business continuity plan for surveillance, including cross-training of staff for respiratory virus surveillance activities

### Physicians

- Report by telephone to the medical officer of health as soon as an influenza virus of pandemic potential is suspected.

## Activities by Pandemic Phase

### Interpandemic Period

Canadian Pandemic Phase		Activities
1.0	No new virus subtype is present in humans. Subtype that has caused human infection may be present in animals <u>outside</u> Canada. Risk to humans is low.	<ul style="list-style-type: none"> <li><input type="checkbox"/> Routine annual influenza surveillance               <ul style="list-style-type: none"> <li><input type="checkbox"/> Disease surveillance                   <ul style="list-style-type: none"> <li><input type="checkbox"/> ILI activity by DHA (FluWatch)</li> <li><input type="checkbox"/> Rate of ILI activity in the general population (sentinel physicians)</li> <li><input type="checkbox"/> Number of laboratory-confirmed outbreaks in long-term care facilities</li> <li><input type="checkbox"/> Number of influenza-associated hospitalizations and influenza-associated deaths in children 0–18 years through the Immunization Monitoring Program ACTIVE (IMPACT)</li> </ul> </li> <li><input type="checkbox"/> Laboratory surveillance                   <ul style="list-style-type: none"> <li><input type="checkbox"/> Number of laboratory-confirmed cases</li> <li><input type="checkbox"/> Percentage of positive influenza tests</li> <li><input type="checkbox"/> Strain characterization, number identified for each strain and subtype, and percentage of total for approximately 10% of isolates</li> </ul> </li> </ul> </li> <li><input type="checkbox"/> Routine SRI surveillance</li> </ul>
1.1	No new virus subtype is present in humans. Subtype that has caused human infection is present in animals <u>inside</u> Canada. Risk to humans is low.	<ul style="list-style-type: none"> <li><input type="checkbox"/> As for Phase 1.0.</li> </ul>
2.0	No new virus subtype present in humans. Animal influenza virus subtype that poses substantial risk to humans circulating in animals <u>outside</u> Canada.	<ul style="list-style-type: none"> <li><input type="checkbox"/> As for Phase 1.0.</li> </ul>
2.1	No new virus subtype present in humans. Animal influenza virus subtype that poses substantial risk to humans circulating in animals <u>inside</u> Canada.	<ul style="list-style-type: none"> <li><input type="checkbox"/> As for Phase 1.0.</li> </ul>

## Pandemic Alert Period (Phases 3, 4, and 5)

Canadian Pandemic Phase		Activities
3.0	New virus subtype is present in humans <u>outside</u> Canada (single cases). No or rare instances of human-to-human spread.	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue usual surveillance activities as for Phase 1.0</li> <li><input type="checkbox"/> Track, collate, and disseminate international surveillance information (through PHAC, PIC, CIOSC); update areas of concern lists for SRI and distribute to stakeholders</li> </ul>
3.1	New virus subtype is present in humans <u>inside</u> Canada (single cases). No or rare instances of human-to-human spread.	<ul style="list-style-type: none"> <li><input type="checkbox"/> Continue usual surveillance activities as for Phase 1.0</li> <li><input type="checkbox"/> Monitor for unusual outbreaks and cluster activity</li> <li><input type="checkbox"/> Track, collate, and disseminate national surveillance information (through PHAC, PIC, CIOSC); update areas of concern lists for SRI and distribute to stakeholders</li> <li><input type="checkbox"/> For each case, provide a detailed epidemiological description including estimation of incubation and communicability periods</li> <li><input type="checkbox"/> If antiviral drugs are used for post-exposure prophylaxis (PEP), provide details on the length of time individuals were given PEP, the number of individuals on PEP who developed ILL, and serious adverse events.</li> </ul>
4.0	New virus subtype is present in humans <u>outside</u> Canada (small clusters). Limited human-to-human spread.	<ul style="list-style-type: none"> <li><input type="checkbox"/> As for Phase 3.0.</li> </ul>
4.1	New virus subtype is present in humans <u>inside</u> Canada (single cases; no clusters). Limited human-to-human spread.	<ul style="list-style-type: none"> <li><input type="checkbox"/> As for Phase 3.1</li> </ul>
4.2	New virus subtype is present in humans <u>inside</u> Canada (small localized clusters). Limited human-to-human spread.	<ul style="list-style-type: none"> <li><input type="checkbox"/> As for Phase 3.1.</li> <li><input type="checkbox"/> For each cluster, conduct an outbreak investigation, including the number and epidemiological description of the settings involved, and report to PHAC.</li> </ul>

## Pandemic Alert Period (Phases 3, 4, and 5) Cont'd

Canadian Pandemic Phase		Activities
5.0	New virus subtype is present in humans <u>outside</u> Canada (large clusters). Localized human-to-human spread.	<input type="checkbox"/> As for Phases 3.0 and 4.0
5.1	New virus subtype is present in humans <u>inside</u> Canada (single cases; no clusters).	<input type="checkbox"/> As for Phases 3.1 and 4.1
5.2	New virus subtype is present in humans <u>inside</u> Canada (large clusters). Localized human-to-human spread.	<input type="checkbox"/> As for Phase 4.2

## Pandemic Period (Phase 6)

Canadian Pandemic Phase		Activities
6.0	New virus subtype in humans outside Canada (in the general population). Sustained human-to-human spread.	<ul style="list-style-type: none"> <li>□ As for Phase 3.0</li> </ul>
6.1	Pandemic virus subtype in humans inside Canada (single cases; no clusters).	<ul style="list-style-type: none"> <li>□ As for Phases 3.1 and 4.1</li> </ul>
6.2	Pandemic virus subtype in humans inside Canada (localized or widespread activity). Sustained human-to-human spread.	<ul style="list-style-type: none"> <li>□ Track, collate, and disseminate national and provincial surveillance information; minimum data elements to be collected being developed nationally           <ul style="list-style-type: none"> <li>□ Disease surveillance               <ul style="list-style-type: none"> <li>□ Discontinue surveillance of rate of ILI activity in the general population by sentinel physicians</li> <li>□ Discontinue surveillance of number of laboratory-confirmed outbreaks in long-term care facilities</li> <li>□ Continue surveillance of ILI outbreaks in long-term care facilities</li> <li>□ Continue surveillance of influenza mortality through IMPACT</li> <li>□ Continue surveillance of school and workplace absenteeism</li> </ul> </li> <li>□ Laboratory surveillance               <ul style="list-style-type: none"> <li>□ Discontinue tracking percentage of positive influenza tests</li> <li>□ Discontinue laboratory surveillance once the novel strain is identified in Nova Scotia</li> <li>□ Discontinue laboratory testing for adenovirus (RSV testing will continue on select specimens)</li> <li>□ Certain proportion (approximately 1–2 specimens a week) of specimens from clinical sites (e.g., flu clinics) will be sent to the NML for characterization</li> <li>□ Discontinue routine SRI surveillance</li> </ul> </li> </ul> </li> </ul>

## Annex 3~A: FluWatch Definitions

The case definition for influenza-like illness is developed by a pan-Canadian surveillance committee and is available on the Public Health Agency of Canada's FluWatch website, [www.phac-aspc.gc.ca/fluwatch/](http://www.phac-aspc.gc.ca/fluwatch/) (click on Definitions & calendar for the 2006/07 season). The case definition may change based on available epidemiological data.

### **Influenza-like illness (ILI)**

Acute onset of respiratory illness with fever and cough and with one or more of the following: sore throat, arthralgia, myalgia, or prostration that could be due to influenza virus. In children under 5 years, gastrointestinal symptoms may also be present. In patients under 5 years or 65 years and older, fever may not be prominent.

### **Laboratory-confirmed influenza**

A confirmed case is defined as clinical illness (i.e., ILI) with laboratory confirmation of infection through

- isolation of influenza virus from an appropriate clinical specimen

OR

- demonstration of influenza virus antigen in an appropriate clinical specimen.

### **Outbreaks**

Surveillance for outbreaks of ILI and influenza is conducted in long-term care facilities, other residential facilities, acute care hospitals, schools, and day-care centres. The definition of an outbreak of ILI/influenza depends on the type of facility:

- *Schools, workplaces, day-care centres*

Greater than 10 per cent absenteeism on any day that is most likely due to ILI.

- *Residential facilities*

Two or more cases of ILI within a seven-day period, including at least one laboratory-confirmed case.

## Activity levels

The level of influenza activity in each reporting region (district health authority) is determined by the presence of both laboratory-confirmed cases and outbreaks and may be defined as one of the following:

1. No activity reported: no laboratory confirmed influenza detections during the prior four weeks; however sporadically occurring ILI may be reported.
2. Sporadic activity: Sporadically occurring ILI and confirmed influenza<sup>1</sup> with NO outbreaks detected within the influenza surveillance region<sup>2</sup>.
3. Localized activity: Sporadically occurring ILI and confirmed influenza<sup>1</sup> together with outbreaks of ILI in schools and worksites or laboratory-confirmed influenza in residential institutions occurring in less than 50 per cent of the influenza surveillance region<sup>2</sup>.
4. Widespread activity: Sporadically occurring ILI and confirmed influenza<sup>1</sup>, together with outbreaks of ILI in schools and worksites or laboratory-confirmed influenza in residential institutions occurring in greater than or equal to 50 per cent of the influenza surveillance region<sup>2</sup>.

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1. Confirmation of influenza within the surveillance region at any time within the prior four weeks.
  2. Sub-regions within the province or territory as defined by the provincial/territorial epidemiologist.

## Annex 3~B: Nasopharyngeal Swab Procedure (PHAC 2006)

Please note that point of care testing is not recommended during an influenza pandemic.

### Nasopharyngeal Swab Procedure

1. Use the swab supplied with the viral transport media.
2. Explain the procedure to the patient.
3. When you collect specimens, wear gloves and a mask. Change gloves and wash your hands between each patient.
4. If the patient has a lot of mucus in the nose, this can interfere with the collection of cells. Either ask the patient to use a tissue to gently clean out visible nasal mucus or clean the nostril yourself with a cotton swab.
5. Estimate the distance to the nasopharynx: Prior to insertion, measure the distance from the corner of the nose to the front of the ear and insert the shaft **only half this length**.
6. Seat the patient comfortably. Tilt the patient's head back slightly to straighten the passage from the front of the nose to the nasopharynx to make insertion of the swab easier.
7. Insert the swab provided along the medial part of the septum, along the floor of the nose, until it reaches the posterior nares; gentle rotation of the swab may be helpful. (If resistance is encountered, try the other nostril; the patient may have a deviated septum.)

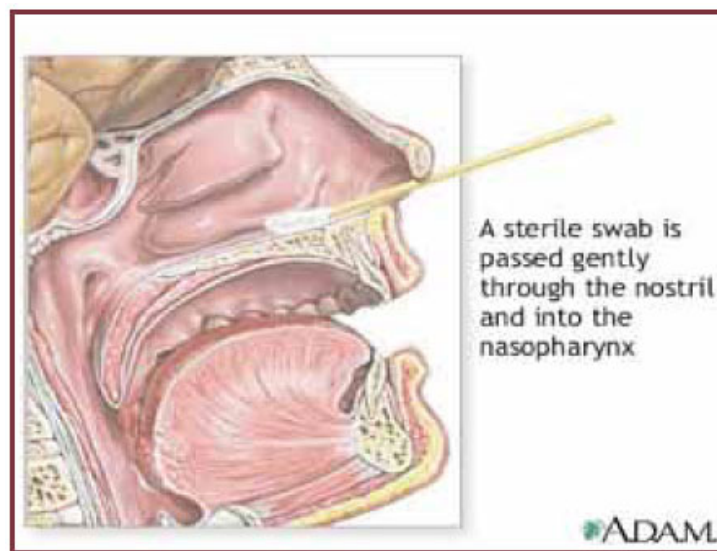


Image obtained from [www.nlm.nih.gov/medlineplus/ency/imagepages/9687.htm](http://www.nlm.nih.gov/medlineplus/ency/imagepages/9687.htm)

8. Allow the swab to sit in place for 5–10 seconds.
9. Rotate the swab several times to dislodge the columnar epithelial cells. *Note: Insertion of the swab usually induces a cough.*
10. Withdraw the swab and place it in the collection tube.
11. Refrigerate immediately.
12. Remove gloves
13. Wash hands.
14. Attach completed requisition.
15. Transport specimen to the laboratory.

## Reference List

Health Canada. Advisory Committee on Epidemiology and the Division of Disease Surveillance, Bureau of Infectious Diseases, Laboratory Centre for Disease Control, Health Protection Branch, Health Canada. 2000. *Case Definitions for Diseases under National Surveillance*. Cat. No. H49-141/2000. Ottawa: Minister of Public Works and Government Services Canada.

Public Health Agency of Canada. 2006. *The Canadian Pandemic Influenza Plan for the Health Sector*. Ottawa: Public Health Agency of Canada. <http://www.phac-aspc.gc.ca/cpip-pclcpi/> (June 4, 2007).

United States Centers for Disease Control and Prevention. January 1988. *CDC Surveillance Update*. Atlanta, GA: Centers for Disease Control.