

Pandemic Influenza

Section 2: Planning Environment and Assumptions

2. Planning Environment and Assumptions

2.1 WHO Pandemic Phases

The World Health Organization (WHO) has identified four distinct pandemic periods before, during and after an influenza pandemic. The post-pandemic period is a time for recovery, evaluation and return to the interpandemic period.

Specific phases subdivide each period, according to the assessed risk of a pandemic. Several factors trigger changes from one phase to another. These include the spread of the disease among humans and the characteristics of circulating viruses. There are international, national, provincial and local planning and response actions associated with each phase.

Table 2.1: WHO Pandemic Periods and Phases⁵

Period	Phase	Description
Interpandemic Period	Phase 1	No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk ^a of human infection is considered to be low.
	Phase 2	No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk ^a of human disease.
Pandemic Alert Period	Phase 3	Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.
	Phase 4	Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans ^b
	Phase 5	Large cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk). ^b
Pandemic Period	Phase 6	Increased and sustained transmission in general population ^b
Post-Pandemic Period		Return to interpandemic period

a The distinction between phase 1 and phase 2 is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localized or widespread, and/or other scientific parameters.

b The distinction between phase 3, phase 4 and phase 5 is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strains (if derived from an animal strain), and/or other scientific parameters.

2.2 Canadian Pandemic Phases

The phases used in Canadian planning have been adapted from the WHO phases. Sub phases have been added to identify levels of novel virus activity in Canada.

The Canadian levels are: 0 – no activity observed in Canada; 1 – single case(s) observed in Canada (i.e. no clusters) and; 2 – localized or widespread activity in Canada.

Table 2.2: Canadian Pandemic Phases		
Definition	Hypothetical Example(s)	WHO Phase
Interpandemic Period - Phase 1.0		
No new virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals located outside of Canada. If present in animals, the risk of human infection/disease is considered to be low.	Highly pathogenic H7N3 detected in poultry outside of Canada	1
Interpandemic Period - Phase 1.1		
No new virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection is present in animals in Canada but the risk of human infection/disease is considered to be low.	Highly pathogenic H7N3 detected in poultry in Canada	1
Interpandemic Period - Phase 2.0		
No new virus subtypes have been detected in humans. However, an animal influenza virus subtype that poses substantial risk to humans is circulating in animals located outside of Canada.	Highly pathogenic H5N1 detected in poultry flocks outside of Canada	2

Interpandemic Period - Phase 2.1		
No new virus subtypes have been detected in humans. However, an animal influenza virus subtype that poses substantial risk to humans is circulating in animals in Canada.	Highly pathogenic H5N1 detected in poultry flocks in Canada	2
Pandemic Alert Period – Phase 3.0		
Outside Canada human infection(s) with a new subtype are occurring, but no human-to-human spread, or at most rare instances of spread to a close contact has been observed. No cases identified in Canada.	Outside Canada, sporadic human cases are occurring in connection to an avian outbreak.	3
Pandemic Alert Period – Phase 3.1		
Single human case(s) with a new subtype detected in Canada. Virus is not known to be spreading from human-to-human, or at most rare instances of spread to a close contact have been observed.	Case imported into Canada from area outside Canada experiencing an avian outbreak. Case arising in Canada <i>de novo</i> OR in association with an avian outbreak in Canada.	3
Pandemic Alert Period – Phase 4.0		
Outside Canada, small cluster(s) with limited human-to-human transmission are occurring but spread is highly localized, suggesting that the virus is not well adapted to humans. No cases identified with these cluster(s) have been detected in Canada.	Outside Canada, small cluster(s) of human cases are occurring in connection to an avian outbreak.	4
Pandemic Alert Period – Phase 4.1		
Single human case(s) with virus that has demonstrated limited human-to-human transmission detected in Canada. No cluster(s) identified in Canada.	Detection of an imported case in Canada that is infected with the virus known to be causing small clusters of human cases outside Canada.	4
Pandemic Alert Period – Phase 4.2		
Small localized clusters with limited human-to-human transmission are occurring in Canada but spread is highly localized, suggesting that the virus is not well adapted to humans.	Detection of a localized cluster of cases in Canada linked to an imported case OR from cases arising in Canada.	4

Pandemic Alert Period – Phase 5.0		
Outside Canada larger cluster(s) are occurring but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans but may not yet be fully transmissible (substantial pandemic risk). No cases identified with these clusters have been detected in Canada.	Outside Canada, larger cluster(s) of human cases are occurring in connection to an avian outbreak.	5
Pandemic Alert Period – Phase 5.1		
Single human case(s) with virus that is better adapted to humans detected in Canada. No cluster(s) identified in Canada.	Detection of an imported case in Canada that is infected with the virus known to be causing larger clusters of human cases outside Canada.	5
Pandemic Alert Period – Phase 5.2		
Larger localized cluster(s) with limited human-to-human transmission are occurring in Canada but human-to-human spread still localized, suggesting that virus is becoming increasingly better adapted to humans but may not yet be fully transmissible (substantial pandemic risk).	Detection of a large but localized cluster of cases in Canada linked to an imported case OR from cases arising in Canada.	5
Pandemic Period – Phase 6.0		
Outside Canada increased and sustained transmission in general population has been observed. No cases identified with the affected populations have been detected in Canada.	Countries outside of Canada have reported sustained transmission of the new virus in their populations.	6
Pandemic Period – Phase 6.1		
Sporadic infection(s) with the pandemic virus detected in Canada. No cluster(s) identified in Canada.	Detection of an imported case in Canada that is infected with the pandemic virus.	6
Pandemic Period – Phase 6.2		
Localized or widespread pandemic activity observed in Canadian population.	Large numbers of clinical cases being rapidly identified with no history of travel to an affected area.	6

Post-Pandemic Period –Following phase 6 there would be a return to the interpandemic period and recovery activity. There would be a need to address backlog of services, psychosocial effects on staff, staff fatigue, review and analysis of response, debrief of response and adjustment to the plan.

2.3 Planning Assumptions

Past pandemics have varied greatly in terms of severity and impact and the characteristics of the next pandemic will not be known until the pandemic occurs. To ensure consistency in planning for the pandemic standard assumptions have been adopted in keeping with the Canadian Pandemic Influenza Plan. These assumptions will also provide a basis for the actions taken during the planning for and response to the pandemic.

It is important for all health planners to use these common assumptions to ensure preparation and response compatibility. The assumptions summarized below should not be considered predictions for a pandemic but reflect a current view of reasonable assumptions to guide planning activities.

Origin and Timing

- The influenza pandemic will be due to a novel, highly infectious, influenza A subtype likely originating in Southeast Asia.
- Most of the world's population will have little or no resistance to the virus. The severity of illness and the number of people dying will be significantly higher than a seasonal influenza epidemic.
- The virus will be present in Canada and possibly in Newfoundland and Labrador within three months of the WHO declaring a pandemic and it may arrive at any time of year.
- The pandemic will last 12-18 months with more than one wave in a 12 month period.
- The first wave of illness will peak within two to four months after the virus arrives in Canada.
- A second wave may occur within three to nine months of the initial wave and each wave will last approximately six to eight weeks.
- Pandemic strain will predominate over other influenza strains.

Epidemiology

- The incubation period is one to three days.

- The period of communicability is approximately 24 hours before and five days after onset of illness.
- Transmission while asymptomatic is possible but is more efficient in the early stages of illness when the person is symptomatic and viral shedding is high.
- Mode of transmission is primarily large droplet and contact (direct and indirect).
- Possibility for airborne route is controversial (underscores the need for surveillance).
- Initial clinical presentation will be consistent with that of known influenza strains.
- Individuals who recover will be immune.
- Sub-clinical infection will occur. Approximately 50% of the infected population will be asymptomatic.
- The groups that are at high risk for complications or poor outcomes due to annual influenza will be at risk during the pandemic.

Pandemic Impact

- The exact impact and the extent of spread may differ from annual influenza, however this will not be known until the novel virus starts spreading efficiently in the human population.
- The majority of the population (over 70%) will be infected during the pandemic but only 15-35% of the population will become ill.
- The majority of cases will become infected during the first wave, with about 25% of the population clinically ill.
- If the pandemic is mild to moderate (consistent with previous pandemics) and in the absence of any interventions, of those who become clinically ill:
 - Up to 50% will seek outpatient care
 - 1% will be hospitalized
 - 0.4% will die
- Sound medical and ethical judgment will dictate the priorities guiding the use of scarce resources.
- Influenza will likely impact all regions at the same time, thus, there may be no assistance available from other regions.

- Influenza will lead to increased employee absenteeism as a result of personal illness, care-giving responsibilities, fear of contracting the illness at work and/or carrying the influenza virus back to family and friends.
- Workplace-avoidance absenteeism may occur and must be considered in planning for a pandemic; however, based on analysis of previous pandemics and similar outbreaks there is no evidence for this assumption.
- Absenteeism of about 20-25% may be expected at the peak of the first wave of the pandemic.

- doses of the vaccine may be necessary to achieve protection.
- Public health staff will deliver the vaccine through mass immunization, once it is available.
- Vaccines are not 100% effective. Seasonal vaccines protect approximately 70% of healthy adults.
- Antiviral drugs may be useful for treatment if taken within 48 hours of the first symptoms.

2.4 Inter-Jurisdictional Planning and Collaboration

Table 2.3: Pandemic Impact for Newfoundland and Labrador at 35% Attack Rate (Maximum Impact for Moderate Influenza)

Total Deaths	836
Hospitalization (non-death)	2762
Hospitalization (Deaths) (Assumes 70% of total deaths will occur in hospital)	585
Total Hospitalization	3347

Note:
The Regional Health Authorities, with the Department, will complete detailed impact assessment on the health system by region.

* Calculation derived from the use of FluAid Model of the United States Centers for Disease Control

Antivirals and Vaccines

- It is unlikely that an effective vaccine will be available at the start of pandemic activity in Canada but it may be available for a second wave of illness.
- Because the population will have had no previous resistance to the pandemic strain, two

Pandemic influenza planning for the health sector is a collaborative effort of the Department, the Regional Health Authorities and various health partners. As this planning process continues at the regional level throughout the province other partners will contribute and link operationally to provide a seamless, coordinated, emergency management approach to dealing with a pandemic. The establishment of the Regional Health Emergency Management Committees and the Provincial Health Emergency Management Advisory Committee are key components of the inter-jurisdictional approach to pandemic planning.

Contagious viruses such as influenza are not limited by geographic or political boundaries, thus the international, national, provincial, and local health and other sectors must work together to ensure the most positive outcome for the population of the respective jurisdiction.

The development of a National Framework for Health Emergency Management provides a standard guide to emergency management program development and is another tool that will allow ease of collaboration and sharing in the development of a seamless pan Canadian emergency management system.

Pandemic influenza is “not just a health issue” and all government departments and agencies,

municipal councils, non-government agencies and the private sector must develop their own pandemic plans. All groups must collaborate throughout the emergency management process to integrate for the most effective response.

2.5 Incident Management System (IMS)

An incident management system (IMS) is a key element of the response component of any emergency management program. The use of IMS across different sectors and organizations provides a structure and process for managing a response to any emergency or disaster. This system allows an organized response by a single agency to a small incident or a coordinated multi-agency response to a major incident.

An incident management system provides structure and function for an emergency response as it:

- Standardizes the processes for delivery of a coordinated response
- Clarifies functions of related and/or overlapping response groups
- Clarifies and enhances communication within and between response groups
- Establishes use of common terminology
- Establishes common management standards and position descriptions at each level of response
- Uses common report and documentation forms
- Recommends interoperability of communication response equipment
- Provides management of personnel, equipment, facilities and other resources for each layer of authority having responsibility for the incident response
- Adjusts to the nature and scope of the incident

Training in IMS has been introduced in RHAs, however system wide training, and mock exercises are necessary to integrate this into all levels of the health system.

2.6 Ethical Considerations for Decision Making

The **Canadian Pandemic Influenza Plan** (CPIP) sets out several overarching goals for pandemic preparedness and response. These goals are to minimize serious illness and overall deaths, and to minimize social disruption among Canadians because of a pandemic influenza. These goals serve to guide the decision-making around the use of scarce resources.

Health decisions during a pandemic must be based on sound science, accepted ethical values and constructed through open discussion. Before a pandemic, the general population must be informed of the reasoning behind any prioritized allocation or use of scarce resources. Examples of these resources may include things like antiviral drugs, vaccines, diagnostic testing, hospital beds and other equipment. The public must also understand the rationale for any possible reduction of individual liberties that may occur if isolation or quarantine is required. In addition, health care workers need to be comfortable with, and accepting of, the level of risk to which they may be exposed if providing care. The public must be educated about the process so that most people may understand the decisions as being fair and in the best interest of the health and well-being of the public.

2.7 Legislation and Policy Environment

The Newfoundland and Labrador health sector derives its authority from the established legislative and policy direction of the government. This legislation and policy are summarized in Appendix 1. The Regional Health Authorities should review Appendix 1 and other legislation and policy documents to determine their authority to function during pandemic. The gaps identified through this process will be the foundation for recommending changes in policy or legislation.